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MANPOWER REQUIREMENTS FOR SCIENTIFIC AND TECHNICAL COMMUNICATION:

An Occupational Survey of Information Professionals

A Research Project
The University of Pittsburgh
In conjunction with
King Research Incorporated
June 30, 1980

FINAL REPORT

on the

MANPOWER REQUIREMENTS FOR SCIENTIFIC AND TECHNICAL COMMUNICATION: AN OCCUPATIONAL SURVEY OF INFORMATION PROFESSIONALS

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Part One: THE PROJECT CONTEXT

CHAPTER ONE

BACKGROUND
THE PROJECT IN PERSPECTIVE

With the growing acknowledgement of the importance of information as a national resource, the keen attention paid to the establishment for a national policy on information and the increase in the number of educational programs initiated in colleges and universities in the training of information professionals, the need to understand the composition and requirements for such personnel is paramount.

Recent dramatic developments in the scale and methods of applying computer and communication technologies to information handling activities have led to radical realignment of some traditional functions and to the emergence of totally new functions. On the one hand, there is evidence of substantial on-the-job training as personnel to perform these new functions, while on the other hand persons with traditional education are finding difficulty in entering the job market. Thus, much of the national resources research and long range planning of national systems must, in the future, include the impact on these systems of our most valuable resource which is personnel.

There has been little attempt in the past to measure the level of personnel engaged in information activities, to characterize the kind of work performed, or to establish the extent of the impact on the scientific and technical environment. The result is that much of the human effort involved in information-handling activities is poorly identified and improperly classified, making it difficult to get an accurate estimate of the extent of information activities. Due to insufficient reporting, present resource expenditures may well be underestimated, giving inadequate measure of the cost to the nation. Also, the lack of clear job classifications makes it difficult to make personnel projections, to plan future systems, or to provide an integrated approach to education and training of information professionals.

The research covered by this project arose out of the deliberations of representatives of government, industry, and the academic community attending the University of Pittsburgh conference on "Manpower Requirements for the Information Profession," in April, 1976.[1] The conference also recommended the establishment of a consortium of professional, academic, and information industry interests to advise the University of Pittsburgh on the implementation of this and other related research projects. The consortium for the Information Profession was formed in October, 1976. It consists of representatives from several universities and professional associations (see appendix A).

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[1] Debons, Anthony and Donald Shirey, Manpower Requirements for the Information Profession, conference proceedings, University of Pittsburgh, April 21/22, 1976.

In July, 1977 the University of Pittsburgh, with the support of the Manpower Consortium, submitted a proposal to the National Science Foundation for funding of a project designed to determine which information functions are performed in all sectors of the United States economy, and the number of professionals involved in performing each function. The project (later numbered DSI - 7727115) was organized in five separate tasks, as outlined in Figure 1.

In approving the project in July, 1978, the National Science Foundation grouped the five tasks into two distinct phases: Phase 1 to cover the first two tasks -- the classification of information functions and the conduct of a pilot survey; and Phase 2 to cover the remaining three tasks -- conduct of the main survey, analysis of results, and report writing. Funding for Phase 1 was granted immediately, with continuing funding for Phase 2 which was provided after an evaluation of Phase 1 by the Oversight Committee, established for the project.

This technical report includes the data and fundings of the five tasks undertaken in the project.

RELATED RESEARCH

Because the information profession can be considered as deriving from several lineages, it is difficult to claim comprehensiveness in the citation of previous research related to the current project. Within this restriction, however, there are certain aspects of the general area of human resources development that can be used as guideposts in establishing the historical setting relevant to the present effort. Although it is not possible in this short review to cite all of the works we examined, we have included most of them in the Bibliography/ Reading List in this volume, as they may be of interest to other researchers. Our review of the literature was guided by four major areas of concern:

1 *The philosophy underlying various approaches to the assessment of human resources.* Studies are guided by the belief systems of principal investigators, which in turn facilitate the generation of hypotheses regarding the phenomena or issues under study. These belief systems, or conceptual frames of reference, are important in understanding the approach taken to the study and in the assessment of the results of studies undertaken.

2 *The manner in which information professionals are perceived, defined, and discussed.* The term "information professional" is now finding its most fluent expression since the mid-sixties. But it is not clear to whom this term should be applied, and the desire to clarify the situation was one of the motivations for the present project. Variations in the perception of what an "information professional" does provide one basis for understanding the genesis and potential of the information field.

3 *The method used in studies aimed at establishing and assessing the functions performed by information professionals.* In order to be able to compare results of various studies, one needs to be able to account for the way in which the study proceeded and the manner in which data were collected. This is particularly important in understanding the investigator's points of emphasis, interpretation, and the significance attached to certain findings.

4 *Specific identification of functions performed by information professionals.* Studies directly concerned with the identification of information functions were of special interest for this project, particularly with regard to the context in which the functions were discussed.

The insights into these four areas of concern which we gained from our review of earlier studies are indicated below.

The Philosophy Underlying Human Resources Assessment Projects

Basically, manpower projects work with existing job classifications, studying the characteristics of workers in these classifications, and making projections based on statements elicited from the employing organizations. Manpower studies in the information field have tended to focus primarily on the library as an institution (Edwards, 1967 and Bolino, 1969). Some studies are less specific with regard to their frame of reference (Schur and Saunders, 1968, 1976), and yet other studies are careful to indicate that the domain of information workers extends beyond the library as an institution, while not excluding it (AFIPS, 1968; Schur, 1973; Sewell, 1977; Wersig and Seeger, 1978; Machlup and Kagann, 1978). With job identifications available in established institutions, the inclination has been to report the predispositions and attitudes of those holding these positions while a count is made of the number of individuals involved (Wasserman, 1969; Sergean and McKay, 1974; Saunders, 1976).

An overriding assumption underlying most human resources (manpower) projects is that the ability to estimate numbers and requirements of information workers helps in developing the workforce through education and training and thus to meet national needs. The efforts sponsored by the British Library, the National Science Foundation, and the National Commission on Libraries and Information Services, are predicated on this assumption (National Inventory of Library Needs, 1975; Neelameghan and Tocatlian, 1977; President's Reorganization Project, 1978).

The three-phase research program of which the occupational survey of informational professionals reported here is a part, subscribes to the view that the ability to assess human resources requirements aids in the development of more relevant education and training programs. This project provides baseline dàta with regard to persons performing information functions at a professional level, thus identifying a population for further sampling in order to study career profiles and educational needs.

Perception of Information Professionals

An indication of the variety of ways in which information workers have been perceived and studied can be got from a comparison of the terms used by various researchers: "science information specialists" (Georgia Institute of Technology, 1961-1962); "science information manpower" (Battelle Memorial Institute, 1966); "manpower in the library and information profession" (Wasserman and Bundy, 1966; Bolino, 1969); "scientific and technological library and information workers" (Schur and Saunders, 1968); "information processing personnel" (AFIPS, 1968); "information specialists" (Schur, 1973); "library and information workers" (Sergean et al. , 1976); "library and information service staff" (Sewell, 1977); "information personnel" (Wersig and Seeger 1978); "knowledge-producing labor force" (Machlup and Kagann, 1978); "data processing personnel" (President's Reorganization Project, 1978; Datamation Salary Survey, 1980).

Methods Used in Assessing Information Functions

Most of the studies of manpower in the information field used job titles and classifications as the criterion for inclusion rather than performance of designated information functions. Some of the studies which did allude to the functions performed by information workers were by Schur (1973), Saunders (1976), Sewell (1977), Wersig and Seeger (1978) and Machlup and Kagann (1978). The statements on functions were largely deductive, based on observations, returns on survey questionnaires, etc.

The more common approach to studying information manpower requirements was to try to estimate the need for workers with specific job titles, e.g., Information Scientist, Information Specialist, and so on. Gupta et al. (1973) attempted to derive some estimate of the number of individuals needed in these specific job title groups by surveying the industrial, academic, and governmental sectors. This study was important in that it showed the need for identifying information professionals by reference to the functions they perform rather than by job title or qualifications.

Identification of Information Functions

Two studies which dealt with the identification of information functions are Sewell (1977) and Machlup and Kagann (1978). The Sewell report is perhaps the best statement on the subject of the relationship between functions performed and job classifications. It addresses the problems currently faced by Federal government agencies due to the absence of a clear understanding of the functions performed by various classes of information workers. Sewell recommends that functional hierarchies be established and updated from time to time to insure that job classifications keep in step with contemporary developments in library and information science activities. The model for the functions described by Sewell was generated by King et al. (1978). Building on an earlier outline of the production and distribution of knowledge in the United States (Machlup, 1962), Machlup and Kagann (1978) set out eight primary functions performed in the production of knowledge, at both the professional and nonprofessional levels.

It should be noted that Schur (1973) had earlier defined the titles of Information Scientist and Information Specialist, suggesting that there will be an increase in the variety of functions needed to deal with the development of local and worldwide information systems, networks, and increased system-user interaction. Schur also suggested that there would be a reduction in the differences between functions across disciplinary boundaries, a view which reflects a comment by Taylor (Sewell, 1977):

> The profession presently is scattered among a variety of groups – librarians, computer specialists, information managers, journalists, systems engineers, and so on . . . . we must begin to look for similarities rather than differences. Little by little, I think this may be happening.

APPROACH AND METHOD

The Occupational Survey of Information Professionals (1980) was organized in two phases and consisted of five separate stages, as shown in Figure 1. The broad objective of the project was to identify and count the number of persons working as information professionals in the United States, by reference to the *functions* they perform (rather than to their qualifications or job titles/classifications). To achieve this objective, it was necessary to define and test a classification of information functions (phase one) and to conduct a nationwide survey to identify and estimate the number of information professionals who perform these functions in U.S. organizations (phase two). The approach and method used to achieve this objective is discussed below.

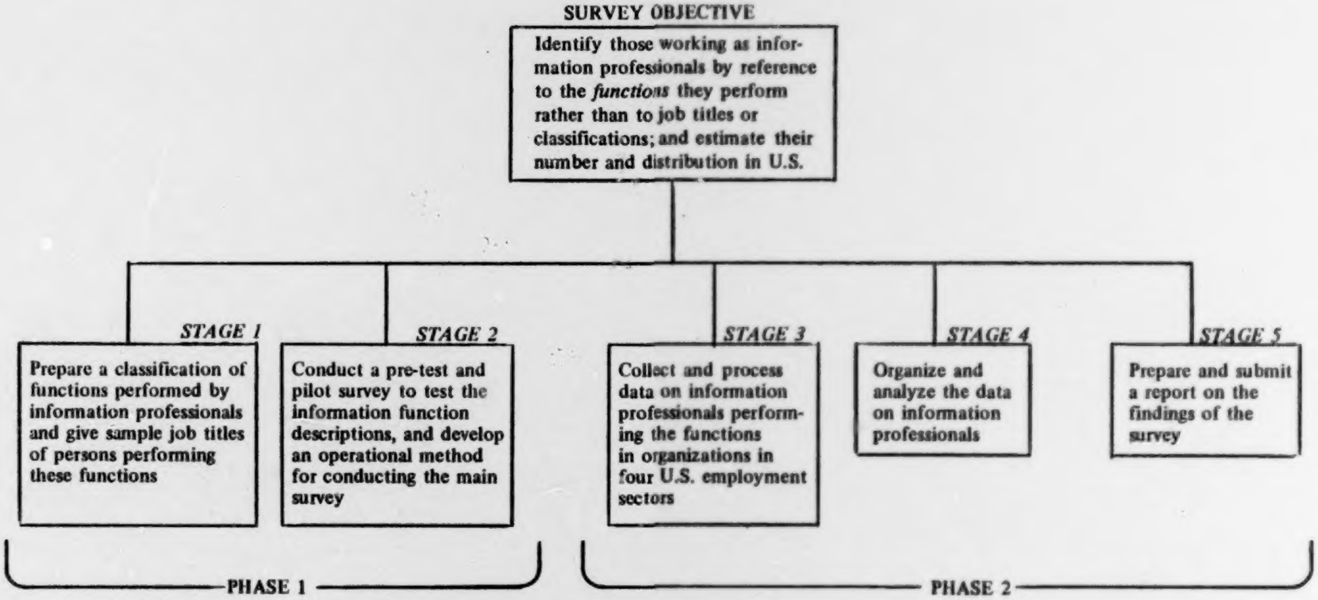
The detailed procedure by which the information functions were identified is given in Chapter Two. In brief, the functions were derived from an analysis of certain employment series in the Federal government regarded as being information-related. This analysis yielded a detailed list of functions which could be regarded as information functions, and to these were added some extra functions from other sources. The detailed list of functions was then aggregated into a set of fourteen basic information functions, which were further edited and grouped to yield a list of nine information functions for use in data collection for the survey. The descriptions of these nine functions were refined as a result of feedback from the pilot survey respondents.

The Pilot Survey

The pilot survey was carried out in two parts: (1) a pre-test in which project staff visited eight representative organizations to explore on a personal basis the concept of information professionals, the functions these professionals perform, and the problems likely to arise in trying to collect data on these workers; and (2) a survey of thirty-five purposively-chosen organizations, carried out by mail with telephone follow up, to test the survey questionnaire and to establish operating procedures for the full-scale survey.

The pre-test results were used for clarifying the terminology used on the survey questionnaire, for assessing the best approach to use with different organization types, for helping to overcome the confusion likely to arise between the rather limited scope of the information professional definition and the wider context in which organizations might consider information activities and personnel, and for gaining insight into the established occupational classifications likely to be used by respondents (e.g., Dictionary of Occupational Titles classifications, etc.).

The objective of the pilot survey was (1) to confirm that the description of information functions was understandable, (2) to determine whether or not the survey would yield sufficient and accurate data for the full-scale survey, and (3) to establish operating information to help in designing the survey.



Identify those working as information professionals by reference to the *functions* they perform rather than to job titles or classifications; and estimate their number and distribution in U.S.

Prepare a classification of functions performed by information professionals and give sample job titles of persons performing these functions

Conduct a pre-test and pilot survey to test the information function descriptions, and develop an operational method for conducting the main survey

Collect and process data on information professionals performing the functions in organizations in four U.S. employment sectors

Organize and analyze the data on information professionals

Prepare and submit a report on the findings of the survey

Figure 1. Objective and Stages of the Occupational Survey of Information Professionals 1980

A total of thirty-five organizations was purposively chosen for the pilot survey, including four universities and colleges, seven Federal agencies, two local government units, and twenty-two industrial organizations. The aim was to answer questions about the organizations and to anticipate problems that might arise in the main survey. The four universities and colleges consisted of two large universities, a small college, and a medical school that is separate from its parent university. The Federal agencies were chosen because of their size and location (central unit versus regional office), because of the ability of one of them to yield library data, and because one agency was primarily concerned with information activities. The two counties were chosen so as to include specific units within the county governments. The industrial establishments were chosen to cover large and small sizes, headquarters operations, nonprofit and profit companies, organizations such as hospitals, and information businesses such as firms engaged in publishing, computing, research, and information brokerage. The response from these organizations was encouraging and is set out in detail in the Progress Report on this project.[2]

Apart from helping to clarify terminology and operating procedures, the pilot survey resulted in the decision to drop two sections which had been included on the pilot survey questionnaire. The first of these sought to collect data on the primary and secondary purposes of automated information systems used by respondents, and the second sought to collect data on the overall number of professionals (all types) in the responding organization. These latter data would have been used to increase the statistical precision of the ratio estimation procedure described later in this Chapter. However, it was felt that the inclusion of these two sections made the questionnaire too long and increased the burden for the respondent sufficiently to risk a negative reaction to the questionnaire as a whole.

Procedures for the Main Survey

The full-scale occupational survey of information professionals studied organizations that employed information professionals. Organizations chosen in the sample (by a method explained under "Sample Design" below) were telephoned and told of the intention to mail a survey questionnaire and letter (samples in Appendix E). Advice was sought as to who in the organization would be best suited to respond to the questionnaire, and the letter was then addressed personally to the person recommended. The letter asked for cooperation and requested that if the data were not readily available to the respondent, some consultation should take place with supervisors, unit heads, and others who were familiar with the functional division of work in the organization. The types of respondents included general managers, personnel managers and officers, institutional reporting specialists, unit supervisors, and others.

The questionnaire, which had been approved by the Office of Management and Budget, was designed to collect demographic data on the organization and data on the specific institutional subunits in which information professionals were located, their occupational titles, and their primary information functions. Professional-level work was defined as generally requiring college education at Bachelor's degree level in a relevant area, or the equivalent in work experience. The information work activity was defined as a function, or set of functions, on which the employees spent at least fifty percent of their time or which employers considered to be their primary responsibility even though it involved less than fifty percent of their time.

Many of the organizations responded promptly, but in a small number of these cases it was necessary to telephone the respondents in order to clarify aspects of the response. The remaining organizations were telephoned (a) to confirm that they had received the letter and questionnaire and if not to have a second set mailed, (b) to ask if they were having difficulty in filling out the questionnaire (assuming they had received it) and to offer help or clarification, and (c) to offer to take the data by telephone either then or at a prearranged future time. Much effort went into this telephone followup and it is felt that this contributed to the good response to the survey, particularly from the industrial sector.

Sample Design

The survey provided estimates for the following four sectors of the U.S. economy:[1]

1 Industrial Organizations (excluding institutions of higher education, including other nonprofit organizations)
2 State and Local Governments
3 Federal Government
4 Colleges and Universities

In developing the sample, subcategories of the four sectors were treated separately, in that different list sources were used as sampling frames. The sectors and their subcategories comprised separate strata. This does not mean that estimates for the subcategories were given any special priority, but rather that they were included so as to provide more precise statistical estimates. The four sectors were sampled as shown in Figure 2.

Sampling frames were stratified for sample selections by industry, activity, or type of unit (depending on the sector) and by size of listing unit measured by number of employees. In all sectors an attempt was made to designate as certainty selections the establishments or organizations which appeared to handle a significant amount of information processing. Listings in specialized information service directories, and the professional knowledge of information specialists associated with the survey, were used to determine the certainty selections.

Sectors	Strata Factors	Sample Size[a]	No. of responses
Industrial organizations	SIC categories[b] Employment size	1,607	878
State and local gov't	State and local Function (state only) Employment (local only)	329	166
Federal government	Employment size	152	46
Colleges/universities	Universities Other 4-yr colleges	270	103
		2,358	1,193

Figure 2. Summary of the Stratification and Sampling Approach

[a] excluding invalid organizations
[b] Standard Industrial Classification

In addition to the special strata discussed above, the industrial sector was categorized by Standard Industrial Classification (SIC) group (a list of SIC codes included in the sample is given in Appendix B) and by degree of importance for this survey. The Industry sampling frame (a sample extracted from the Dun and Bradstreet directory of some four million listings) was further stratified by size of establishment, yielding a total of six substrata.

The Census computer file of state and local jurisdiction summary records from the 1977 *Census of Governments* was used as the sampling frame for these categories. Reporting jurisdictions below fifty employees were excluded. Local jurisdictions were divided into two categories: small jurisdictions sampled as complete jurisdictions (with the exception of Education), and large jurisdictions sampled on a function basis. The large local jurisdictions and states were arrayed by function (in a few cases, by combinations of functions). Local jurisdictions and states thus appeared multiple times in the sampling frame, corresponding to each governmental function for which they report employment to the Census Bureau, and thus having multiple chances of selection as reporting units. Sample selection was made by probability-proportionate-to-size procedures, with full-time employment reported for the function or jurisdiction as the measure of size.

Federal agencies were sampled from a computer printout of Submitting Offices (SOs) which was purchased from the Office of Personnel Management. Again, the sample design was based on selection with probability proportionate to size, using full-time employment counts as measures of size. A list of Submitting Offices was ordered by agency, but those organizations with fewer than fifty employees were excluded.

For the Colleges and Universities sector, institutions were stratified into university, other four-year colleges, and junior college categories following National Center for Educational Statistics (NCES) definitions. The sample was drawn from each stratum with probability proportionate to size (PPS). Reporting institutions with fewer than fifty employees were excluded from the sample universe in each case; therefore, a number of information professionals in institutions of this size are not included in the estimates. The number of full-time employees was used as a basis for PPS selection.

Estimation

The estimates were made by weighting each individual response by the inverse of the probability of selection and by adjusting to reflect non-responses of selected samples or non-responses to individual questions found in otherwise filled-out questionnaires. Thus, the estimates of totals should reflect the actual numbers of information professionals in the universe from which the samples were chosen. Statistical precision of some estimates was also estimated based on a replicated sampling approach, which is discussed further below.

A statistical method, ratio estimation, was also used to improve statistical precision of survey results. This involves using a known auxiliary variable to calculate some estimates. For example, Census data provided accurate estimates of the number of professionals employed in the various industries or occupational areas. Since the number of information professionals is highly correlated with a number of professions or occupations among organizations, the data could be used to improve the precision of estimates of the total number of information professionals.

There are four conditions necessary to use ratio estimation procedures. These are that one must have both the covariate number for the population and the number for the organization surveyed. Then the ratio must be sufficiently small and the correlation of the two variables must be sufficiently high to make the ratio estimates valid or worth pursuing.

NOTES AND REFERENCES : CHAPTER ONE

1 The following limitations were placed on the samples drawn for the sectors:

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Chapter Two
CLASSIFICATION OF INFORMATION FUNCTIONS

Defining the Information Professional

Having found no consensus in the literature as to how an information professional should be identified, a thesis was formulated for the guidance of the survey designers, as follows:

> An information professional may be differentiated from other professionals who may also work with data by the fact that s/he is concerned with content (the meaning applied to symbols) and therefore with the cognitive/intellectual operations performed on the data by an end-user.

Six generic groups of information professionals were identified, and the aim of the survey designers was to allocate each major information function, or group of functions, to one of these six categories of professionals:

1 *Managers of Information* who plan, develop, coordinate, and control information programs, and the human and material resources needed for their implementation

2 *Information Operations Coordinators* who perform functions with regard to (a) the data or knowledge base and (b) the end-user, in the installation operation, maintenance, and control of information systems, their equipment, and processes

3 *Information Systems Specialists* who analyze information problems, and who design, implement, and evaluate solutions

4 *Information Intermediaries* who work between the end-user and the data and knowledge sources, helping the user reach an informed state

5 *Information Theorists* who are concerned with the development of laws, theories, philosophy, and sociology of information environments.

6 *Educators of Information Workers* who provide education and/or training for the above five categories of information professionals and for nonprofessional information workers

In allocating information functions to the six generic groups of professionals, it was expected that the functions performed by managers of information, intermediaries, theorists, and educators would be relatively easy to identify, with those of the information operations coordinators and the information systems specialists being much more difficult to delineate.

Exclusions

Because almost all white-collar workers are involved with data and information, it was necessary before attempting to outline information functions to give some consideration to which groups of professionals should be excluded from the survey. The following groups were considered to be candidates for exclusion:

- Managers and administrators, other than managers and administrators of information programs and resources; because their purpose in working with data and information was to manage and control, not to assist a third party to become informed
- Salespersons, other than those selling information products or services; because their dissemination of information was aimed at selling a product or service, not just at helping the client to reach an informed state ("detail-men" being a possible exception)
- Workers in the information field who operate below the professional level; simply because this particular project was limited to identifying information "professionals" as distinct from information workers in general
- Professionals in the information field who work only with hardware design and development; because they were not usually concerned with the cognitive operations of the end-user of system output, their orientation being more towards machine performance
- Professionals in information-intensive fields such as education, law, journalism, etc., other than those in these fields whose primary activity was aimed at assisting a third party to reach an informed state; because their professional activity usually involved a level of synthesis much deeper than that required of an information professional, and as such made them "creators of information"
- Researchers, other than those who research with information (i.e., solve research problems by gathering, analyzing, and interrelating data from a combination of sources); because they are end-users of data and information
- Advertising professionals, other than those involved in the promotion of information products and services; because the level of persuasion in their communication with clients went beyond merely helping them to reach an informed state

Overlap With Other Professions

Because information functions are involved with *content*, an important question arises regarding the amount of subject expertise needed to perform information functions in certain fields. Technical, linguistic, or other considerations may require that information functions be carried out by workers with professional training in a certain discipline (e.g., chemistry, metallurgy, etc.). These workers, who perform information functions while remaining as members of other professions, need to be distinguished from information professionals whose primary expertise is in information work but who possess broad subject knowledge which enables them to operate in specialized disciplines.

In this connection, it is interesting to note the tendency for "information groups" to form within established professions, bonded together by their subject specialty. This is, perhaps, most noticeable among those working with computers who have, among other things, extended and developed programming languages to suit their fields of expertise. Information groups communicate with similar groups from other professions, including the information profession, thus keeping abreast of the latest developments in information science and technology, while remaining within their original professions.

Although it is very difficult to identify information workers with discipline-oriented job titles, the emphasis on "functions performed" as the criterion for inclusion in this survey was intended to yield some insight into the overlap between the information profession and other professions, and the relationship between the information professional (the generalist) and the professional (e.g., chemist, attorney, engineer, metallurgist) who has assumed information functions as a primary work activity (i.e., performs these functions more than fifty percent of the time).

Building the Information Function Classification

With no readymade population of information professionals to survey, and in recognition of the problem of finding those in other professions whose primary work activity was information-related, it was decided that the following criterion should be adopted for inclusion in the occupational survey of information professionals: performance of one or more functions, designated as "information functions" for survey purposes, at a professional level more than fifty percent of the time.

There were two distinct stages in developing the list of information functions for use in the survey: (1) the identification of functions or groups of functions which could be legitimately described as information functions; and (2) the grouping of these functions for display on the survey questionnaire, together with sample job titles for each group of functions.

Figure 3 gives the results of the first of these stages. Each group of functions proposed as information functions is related to one of the six generic groups of information professionals established for survey purposes (see *Defining the Information Professional* above) and is broken down to the level of operational functions in the following pages. These functions were identified by:

- analyzing job functions for twenty of the Federal government employment series, as published in the U.S. Civil Service Commission (now Office of Personnel Management) *Position Classification Series*[1] each of which series was judged to be information-intensive, namely:

GS 132	Intelligence Series
GS 334	Computer Specialist Series
GS 343	Management Analysis Series
GS 345	Program Analysis Series
GS 391	Communications Management Series
GS 393	Communications Specialist Series
GS 669	Medical Record Librarian Series
GS 1081	Public Information Series
GS 1083	Technical Writing and Editing Series
GS 1084	Visual Information Series
GS 1160	Financial Analysis Series
GS 1410	Librarian Series
GS 1411	Library Technician Series
GS 1412	Technical Information Services Series
GS 1420	Archivist Series
GS 1515	Operations Research Series
GS 1529	Mathematical Statistician Series
GS 1530	Statistician Series
GS 1531	Statistical Assistant Series
GS 1550	Computer Scientist Series

- adding extra functions for the two Civil Service job series Librarian (GS1410) and Technical Information Services (GS1412), which were proposed in the report prepared for the Federal Library Committee by Winifred Sewell in December 1977[2]

- adding a further two groups of functions not found in either of the above sources: Information Policy Planning/Control (a function just beginning to evolve), and Education and Training of Information Workers

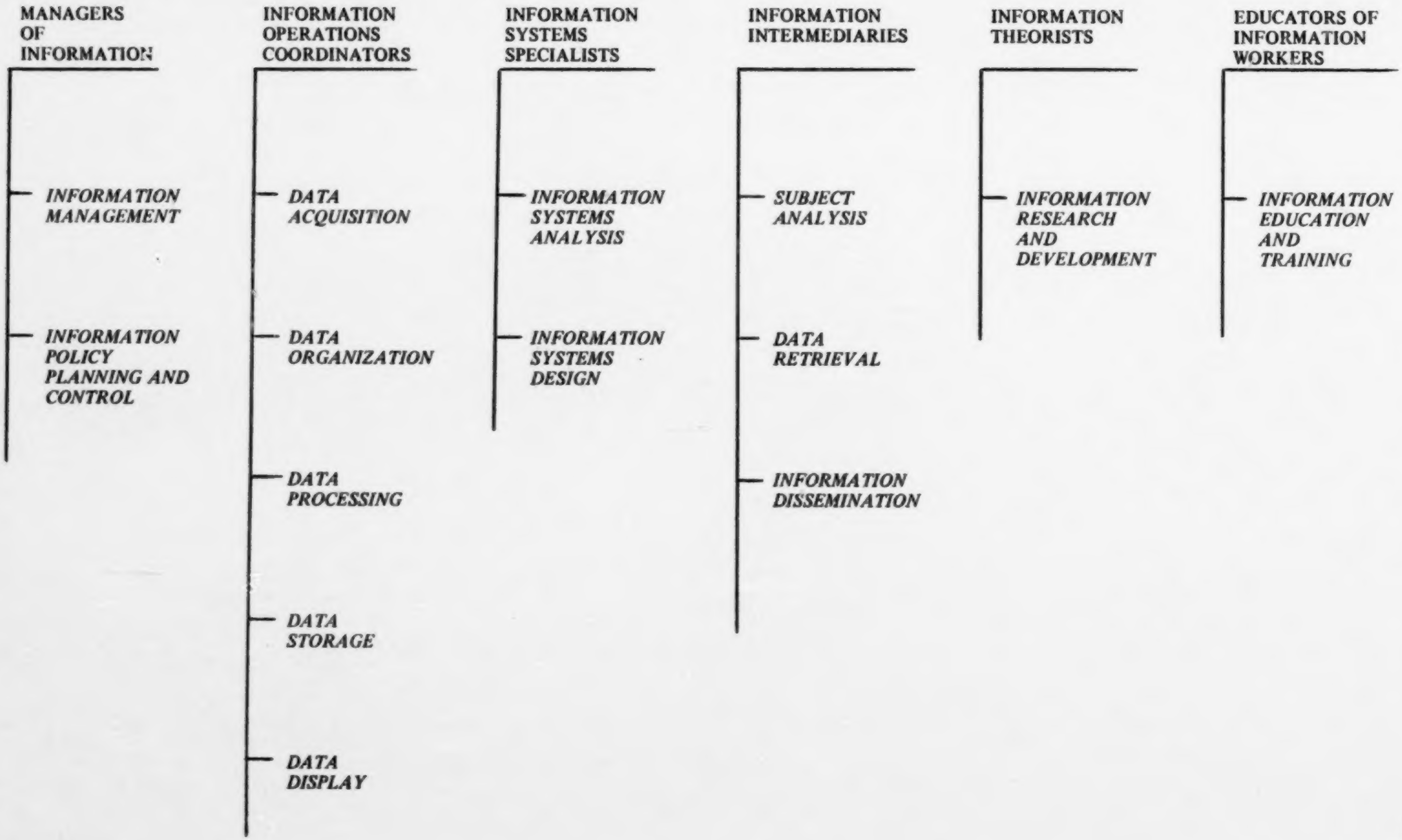

MANAGERS OF INFORMATION
INFORMATION MANAGEMENT
INFORMATION POLICY PLANNING AND CONTROL
INFORMATION OPERATIONS COORDINATORS
DATA ACQUISITION
DATA ORGANIZATION
DATA PROCESSING
DATA STORAGE
DATA DISPLAY
INFORMATION SYSTEMS SPECIALISTS
INFORMATION SYSTEMS ANALYSIS
INFORMATION SYSTEMS DESIGN
INFORMATION INTERMEDIARIES
SUBJECT ANALYSIS
DATA RETRIEVAL
INFORMATION DISSEMINATION
INFORMATION THEORISTS
INFORMATION RESEARCH AND DEVELOPMENT
EDUCATORS OF INFORMATION WORKERS
INFORMATION EDUCATION AND TRAINING

Figure 3. Principal Information Functions in Relation to Generic Groups of Information Professionals

It should be noted that the group of information functions in Figure 3 was intended only as a guide to the establishment of information functions for survey purposes. It is not intended to be a comprehensive list of information functions; the compilation of a scientifically-derived taxonomy of information functions was considered to be outside the scope of this project, though the need for such a taxonomy is strongly supported. It is hoped that the results of this occupational survey may be helpful to any researcher seeking to derive such a taxonomy in the future.

Grouping the Functions for Survey Purposes

The second stage in preparing the list of functions was the grouping of functions for display on the survey questionnaire, together with a set of sample occupational titles. It was felt that fourteen functions was too many to present to respondents, so some regrouping was needed. The groups Data Acquisition and Data Organization were combined under the heading Data/Information Preparation; Data Retrieval and Dissemination were combined under the heading Searching for Information on Behalf of Others; Subject Analysis was renamed Data/Information Analysis; and Data Processing, Data Storage, and Output Display were combined under the heading Operational Information Functions. Figure 4 shows the revised grouping in relation to the generic groups of information professionals; Figure 5 shows the grouping of functions as it appeared on the survey questionnaire.

Detailed descriptions of each of the function groups were supplied for the guidance of survey respondents, and were illustrated by sample occupational titles for persons performing the functions. These were published on the survey questionnaire (samples are given in Appendix E to this report) and are reproduced below.

1 **MANAGING INFORMATION OPERATIONS, PROGRAMS, SERVICES, OR DATABASES: includes planning, directing, or administering information operations, programs, services or databases; establishing budgets, funding, and financial control; planning and controlling resource sharing or networking activities; establishing and implementing security standards for information systems; forming and implementing corporate information policy; integrating information operations, programs, services, or databases with mission of parent organization; surveying users to establish information needs; promoting information products/services. Sample occupational titles:** ***Audio-Visual Administrator, Chief Programmer, Comptroller, Database Manager, Director of Information Center, Library Administrator, Library Director, Manager of Publishing Unit, Management Analyst, Media Manager, Science Editor, and Vice President for Information.***

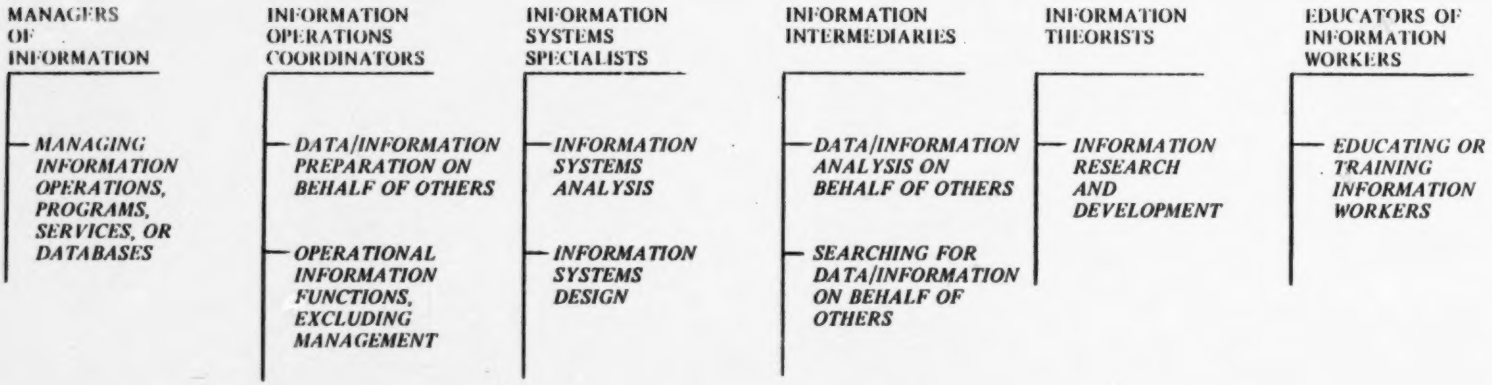

MANAGERS OF INFORMATION
MANAGING INFORMATION OPERATIONS, PROGRAMS, SERVICES, OR DATABASES
INFORMATION OPERATIONS COORDINATORS
DATA/INFORMATION PREPARATION ON BEHALF OF OTHERS
OPERATIONAL INFORMATION FUNCTIONS, EXCLUDING MANAGEMENT
INFORMATION SYSTEMS SPECIALISTS
INFORMATION SYSTEMS ANALYSIS
INFORMATION SYSTEMS DESIGN
INFORMATION INTERMEDIARIES
DATA/INFORMATION ANALYSIS ON BEHALF OF OTHERS
SEARCHING FOR DATA/INFORMATION ON BEHALF OF OTHERS
INFORMATION THEORISTS
INFORMATION RESEARCH AND DEVELOPMENT
EDUCATORS OF INFORMATION WORKERS
EDUCATING OR TRAINING INFORMATION WORKERS

Figure 4. Revised Grouping of Information Functions in Relation to Generic Groups of Information Professionals

NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION (See opposite page for explanation of each letter code)											
A	B	C	D	E	F	G	H	I	J		
Managing information operations, programs, services, or databases	Data / info. Preparation on behalf of others	Data / info. Analysis on behalf of others	Searching for data / info. on behalf of others	Information Systems Analysis	Information Systems Design	Other operational Information Functions excl. management	Educating or Training Information Workers	Information Research & Development	Other Information functions		
									1	2	3

Figure 5. Information Function Descriptions as they Appeared on the Survey Questionnaire

2 PREPARING DATA OR INFORMATION FOR USE BY OTHERS: includes technical writing (but not public relations promotions), editing, or other scientific publishing activities involving journals, technical reports, manuals, instructions, etc.; translating business, scientific or technical works from one language to another; compiling bibliographies, reference materials or referral materials; preparing abstracts, indexes and catalogs; preparing lists or directories of people, buildings, events, etc.; establishing computer numeric or textual data input requirements; transforming data into form required by a computer system, operational system, or library system; preparing other information materials, such as audio-visual, catrographic, etc. Sample occupational titles: *Abstractor, Archivist, Bibliographer, Cataloger, Classifier, Librarian (Research), Librarian (Special Collections), Medical Records Specialist, Science Editor, Survey Data Editor, Technical Editor, Technical Writer, and Translator.*

3 ANALYSIS OF DATA AND INFORMATION ON BEHALF OF OTHERS: includes researching and analysis (but not end-use) of data or information from a library, computer file, or other database; analysis of data or information that goes beyond (but which may include) such activities as abstracting, or simple summarization of previously-written materials, computer system output, or library materials. Sample occupational titles: *Analysis Specialist, Information Counselor, Operations Analyst, Research Assistant,* subject matter specialists (e.g., *Economic Analyst, Financial Analyst, Management Analyst*, and *User Consultant*

4 SEARCHING FOR DATA AND INFORMATION ON BEHALF OF OTHERS: includes diagnosing user needs for information; identifying data sources and developing search strategies; accessing databases either manually (library shelves) or electronically (automated systems); evaluating the yield of data searches (but not performing analysis of data); referring users to other sources of data or information. Sample occupational titles: *Information Counselor, Reference Librarian, Reference Specialist, Referral Specialist, Searcher, and Technical Information Specialist.*

5 INFORMATION SYSTEMS ANALYSIS: includes analyzing existing work processes; determining feasibility of system automation; determining output of product and form; selecting data or information for inclusion in system; recommending design alternatives; evaluating information systems, products or services. Sample occupational titles: *Computer Systems Analyst, Chief Programmer, Data Processing Systems Analyst, Operations Researcher, Senior Programmer, Software Specialist, Systems Analyst, and Word Processing Systems Analyst.*

6 INFORMATION SYSTEMS DESIGN: includes designing new systems or modifying existing systems; establishing procedures for carrying out work processes; implementing the system design; evaluating system output to insure that it meets the user's requirements; documenting the procedures involved in using the system, for system personnel and for users. Sample occupational titles: *Computer Systems Planner, Database Designer, Methods Analyst, Operations Designer, Senior Programmer, Systems Designer, Systems Project Planner, and Word Processing Systems Planner.*

7 OPERATIONAL INFORMATION FUNCTIONS (excluding Management): includes supervising the running of a library or automated information system; controlling and facilitating access procedures; developing and implementing procedures for data input to systems (including library acquisitions); developing and implementing software packages for computer systems; designing applications programs to fit user needs. Sample occupational titles: *Applications Programmer, Archivist, Audio-Visual Specialist, Computer Specialist, Computer System Consultant, Database Administrator, Librarian (Acquisitions), Librarian (Medical Records), Librarian (Special Collections).*

8 EDUCATING OR TRAINING INFORMATION WORKERS: includes teaching courses on information subjects to undergraduate or graduate students; training information professionals and other information workers on the job, in workshops or seminars; planning information education programs; developing information curricula; research on information education (but other information research is included in Function 9 below). Sample occupational titles: *Faculty Member (College or University); Instructor; Lecturer; and Training Officer.*

9 INFORMATION RESEARCH AND DEVELOPMENT: includes studying the foundations, laws, theories, and postulates related to information and information systems, operations, programs, services, or databases; performing research on the creation of new forms of information systems, operations, products, processes, services, etc.; developing models of information systems or operations: designing, collecting, and analyzing secondary and primary data in information research; research on the use of information systems, products, or services; research on information user behavior and characteristics. Sample occupational titles: *Communications Researcher, Computer Scientist, Information Scientist, Library Scientist,* persons with methods expertise (e.g., in Operations Research, Psychology, Statistics, Systems Analysis, etc.) and persons with subject expertise (e.g., in Behavioral Science, Engineering, Mathematics, Philosophy, etc.).

In addition to the nine functions listed above, a tenth category was provided on the questionnaire so that respondents could write in other information functions not included in the nine listed. The most frequently reported "other" function was Marketing of Information Products/Services.

Respondents appeared to have no special difficulty with functions 1, 2, 4 and 8. Some difficulty was reported with function 3 (Analysis of Data and Information on Behalf of Others), mainly with regard to the depth of analysis appropriate for an information professional. With regard to functions 5 and 6 (Information Systems Analysis and Information Systems Design), respondents reported difficulty in separating these two functions, claiming that these functions are often performed as a primary activity by the same person at different points in the development and life cycle of an information system. In interpreting the statistical data for these two functions, this difficulty on the part of the respondent should be borne in mind. Function 7 (Operational Information Functions excluding Management) was sometimes used where the respondent did not have sufficient information about the information professionals activities to allocate them to a more specific function, and this may help to explain the very large numbers reported for this function. Considerable difficulty was experienced with function 9 (Information Research and Development) which was generally interpreted as "researching with information" rather than as "information science research" as intended by the survey designers. Because of the difficulty with this question, responses which were clearly the result of misinterpretation were disregarded and have not been included in the statistical data presented.

Coding Scheme Used in Organizing the Survey Data

Three levels of classification were used in the processing and analysis of the survey data: (1) Subunits, (2) Occupational Title Groups, and (3) Workfields. The first two were self-reported, and the third was derived from an aggregation of survey responses. As these represent new concepts and do not conform readily to any known classification schemes, the reader is advised to study carefully the descriptions of each level before going on to read the survey results. The need to produce this new approach to classification arose because none of the existing schemes was found suitable for information-related occupations and functions.

Subunits

Subunits refer to the type of organizational environments in which information professionals are to be found. Twenty such organizational subunits were identified: ten were specified on page one of the survey questionnaire, and a further ten were derived from an analysis of the most frequently reported subunits written in by respondents on page two of the questionnaire. "Other" and "Unspecified" categories were included, the former to cover subunits written in on page two which were not on the list of twenty, and the latter to cover situations where no indication was given of the organizational environment in which the information professional worked. The twenty subunits are:

1 Abstracting/Indexing Unit
2 Administrative Services Unit
3 Audio-Visual Media Unit
4 Command and Control Unit
5 Communications Unit
6 Computer Operations Unit
7 Databank/Database Unit
8 Extension/Outreach Unit
9 Financial Analysis Unit
10 In-Company Training Unit
11 Information Analysis Unit
12 Library/Archives Unit
13 Management Information Systems Unit
14 Medical Records Unit
15 Public Information/Public Relations Unit
16 Research/Analysis/Planning Unit
17 School/Academic Department
18 Systems Analysis/Programming Unit
19 Technical Information Unit
20 Technical Reports Preparation Unit

Occupational Title Groups (OTGs)

Approximately 1,500 unique occupational titles were reported in the survey. These were grouped for ease in analysis and reporting into forty-eight Occupational Title Groups (OTGs), and these in turn were grouped according to Workfields, a concept which is explained in the next section below.

A full list of the unique occupational titles subsumed under each Occupational Title Group is given in Chapter Eight

1 Computer Workfield

1.1 Management of DP/Computer Services and Systems OTG
1.2 Computer Operations OTG
1.3 Computer User Liaison OTG
1.4 Data Operations OTG
1.5 Programming/Software Development OTG
1.6 Systems Analysis/Design OTG

2 Education/Training Workfield

2.1 Academic Programs: Computer Science OTG
2.2 Academic Programs: Information Science OTG
2.3 Academic Programs: Library Science OTG
2.4 Other Academic Programs OTG
2.5 In-Company Training OTG
2.6 Instructional Development OTG
2.7 Audio-Visual Media OTG

3 Financial Workfield

3.1 Financial Management OTG
3.2 Financial Analysis OTG
3.3 Accountancy OTG
3.4 Budgetary Control OTG

4 Information Services Workfield

4.1 Management of Information Services/Systems OTG
4.2 Marketing of Information Services/Systems OTG
4.3 Educational Information OTG
4.4 Government Information OTG
4.5 Health/Legal/Welfare Information OTG
4.6 Public/Consumer Information OTG
4.7 Scientific and Technical Information OTG

5 Library Workfield

5.1 Library Management OTG
5.2 Archives Management OTG
5.3 Bibliography OTG
5.4 Library Systems Automation OTG
5.5 Reference and Searching OTG
5.6 Subject Specialty OTG
5.7 Technical Services OTG

6 Management Support Workfield

6.1 Management Analysis/Services OTG
6.2 Administrative Systems/Services OTG
6.3 File and Records Management OTG
6.4 Personnel Information OTG
6.5 Planning Information OTG
6.6 Marketing Information OTG

7 Research Workfield

7.1 Management of Research OTG
7.2 Research–General OTG
7.3 Research–Institutional OTG
7.4 Information Analysis/Research Analysis OTG
7.5 Program and Equipment Evaluation OTG

8 Statistical Workfield

8.1 Management of Statistical Services OTG
8.2 Statistical/Mathematical Analysis OTG
8.3 Statistical Programming OTG

9 Technical Publications Workfield

9.1 Print Production OTG
9.2 Technical Reports and Documentation OTG
9.3 Technical Writing and Editing OTG

In allocating unique occupational titles to one of the above Occupational Title Groups, account was taken of the subunit in which the title holder was located and of the primary information function performed by the title holder. It is possible, therefore, for a particular title, e.g., Systems Analyst, to be found in more than one Occupational Title Group, if the analysis by subunit and function showed that the nature of the work performed was substantially different from that performed by another holder of the same title.

The Occupational Title Groups were aggregated into nine Workfields, a concept which is explained next.

Workfields

The analysis of Occupational Title Groups resulted in the identification of nine discrete work areas in which information professionals are active. These have been mentioned under the heading "Occupational Title Groups" above, and are listed alphabetically below:

1 The Computer Workfield
2 The Education/Training Workfield
3 The Financial Workfield
4 The Information Services (Non-Library) Workfield[3]
5 The Library Workfield
6 The Management Support Workfield
7 The Research Workfield
8 The Statistical Workfield
9 The Technical Publications Workfield

Analysis by workfield included two other categories: "Other" for miscellaneous work areas in which there were relatively few responses; and "Unspecified" for cases where no indication was given of the type of work area in which the information professional operated.

Workfields can be thought of as areas of work activity in which information professionals can be grouped according to the nature of the work they do, and independently of their institutional affiliation. An example of the contrast between Subunits and Workfields can be seen by referring to the "library/archives subunit" which denotes an institutional location, and the "library workfield" which denotes work of a library nature, regardless of where it is practised. Similarly, the "research/analysis/planning subunit" refers to a section of an institution, establishment, or agency set aside for the purpose of providing a research service, whereas the "research workfield" refers to work of a research nature, regardless of its institutional setting.

Workfields were considered a useful basis for analysis of survey data, reflecting as they do the perception of an information professional's work as deduced from the occupational title. However, an analysis of workfields by primary information function performed often showed that the work the information professional was actually doing bore little relationship to the occupational title held. This is dealt with in more detail in Chapter Eight.

. . . .

The graphical representation of the distinction this survey makes between Functions, Subunits. Occupational Title Groups, and Workfields, which is given below,may be helpful to the reader in studying the survey report which follows.

FUNCTION ———	*what* the Information Professional actually does on the job
SUBUNIT ———	*where* the Information Professional is located within the organization
OCCUPATIONAL TITLE GROUP ———	*how* the Information Professional is classified in terms of job title and education/training
WORKFIELD ———	*why* and for what general purpose the functions performed by the Information Professional are carried out

Figure 6. Graphic Representation of Coding Levels Used in the Survey

NOTES AND REFERENCES

1 U.S. CIVIL SERVICE COMMISSION *Position Classification Series*, Washington, DC: U.S. Civil Service Commission, Bureau of Policies and Standards. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC, 20402 (Yearly subscription rate).

2 SEWELL, Winifred, *Study of Federal Library/Information Service Staffing as Affected by Classification and Qualification Standards*. Washington, DC: Federal Library Committee, December, 1977. 81p.

3 The "Information Services (Non-Library) Workfield" covers information service functions performed outside libraries, generally by professionals with in-depth knowledge and skill in handling a particular type of information, e.g. Public and Consumer Information, Educational Information, etc., who are not necessarily professional librarians. For examples of occupational titles subsumed under this workfield, see Chapter Eight.

2

Part Two: THE SURVEY FINDINGS

HIGHLIGHTS OF THE SURVEY FINDINGS

☐ A survey of national scope was conducted to estimate the number of information professionals employed in the United States. A working definition of an information professional was formulated to guide the survey designers in deciding who should be included and who should be excluded. Information professionals were to be identified by the function they perform, rather than by their job title or classification. This served to exclude many white-collar workers who work with data and information but who did not meet the criterion for inclusion in the survey. Within the four major employment sectors studied, limits were placed on the type of establishments, agencies, or institutions that were likely to employ information professionals.* These limits, however, resulted in the estimates of information professionals being lower than the real number employed by an undetermined amount.

It was estimated that there were over 1.64 million information professionals employed in the United States in 1980. This estimate has a standard error of 224,000. About seven out of every ten information professionals (1.16 million) were in the industrial sector. Another two in ten (370,500) were in state and local governments. The remaining one in ten was found in the Federal government sector (78,900) or in colleges and universities (30,100).

The principal information functions performed by the 1.64 million information professionals were: (1) systems analysis and design (one in five), (2) management of information operations, programs, services, or databases (one in six), and (3) operational information functions (one in six). Professionals performing these three functions accounted for about one half of the total information professionals reported.

The survey showed that the education and training of information workers was not the exclusive domain of colleges and universities. Survey results indicated that there were six times as many information professionals performing this function in industry and government as were performing it in colleges and universities. (The distinction between "education" and "training," which had not been made in our function description, may be important here.)

Information research and development, as it relates to the study of the foundations, laws, and theories of information and information systems, the development of models of information, and the creation of new systems, was reported as being conducted primarily in industry. In this connection, however, it should be noted that information professionals were reported under their primary information function only and in the case of many university faculty engaged in research, their primary function would be teaching. Thus, the estimate of 200 information professionals engaged in information research and development in colleges and universities is almost certainly too low.

The computer workfield was the predominant workfield, employing about four in ten of the information professionals. Other notable workfields were the management support workfield (one in ten), the library workfield (one in ten), and the information services (non-library) workfield (also one in ten). Comparison of the survey findings with other known data was not always possible, but the library workfield was an exception. The survey estimate for this workfield was around 160,000 information professionals. In 1978 the Current Population Survey of the U.S. Census Bureau showed estimates of 180,000 librarians. (The CPS data are based on self-reporting which generally overstates the number of persons within a given profession.) Thus, the estimate from the occupational survey of information professionals appears to be close to the true number for this workfield.

The larger establishments, agencies, and institutions had organizational subunits that were clearly identified by the respondents. The largest organized subunit, covering all four sectors, to employ information professionals was computer operations, employing nearly 400,000. The systems analysis/programming subunit employed nearly 300,000, while the library/archives subunit and the management information systems subunit were the only other subunits out of the twenty identified for the survey that employed more than 100,000 information professionals.

There were 1,493 unique occupational titles used by the 1,193 establishments, agencies, and institutions for classifying individuals who perform information functions. These titles were organized into groups within each of the workfields and crosstabulated with information functions and subunits of the organization to relate occupational titles to functions being performed and subunits of employment. Two main findings were (1) that occupational titles vary substantially among the sectors even though the functions are the same; and (2) that even with an unambiguous function such as "searching for data and information on behalf of others", a wide range of titles was reported.

In the industrial sector, two organizational subunits employed one-half of the information professionals, They were the computer operations subunit, with 30 percent, and the systems analysis/programming subunit with 20 percent. The primary information function performed in these subunits was operational: controlling and supervising data input to information systems.

The majority (about three out of four) of the information professionals in state and local government agencies were found in agencies with 250 or fewer employees. Managing information operations, programs, services, or databases was the single most frequently cited work activity being performed by information professionals in state and local government agencies. The organizational subunit which employed more information professionals than any other was the library/archives subunit. This subunit employed one in four of the information professionals in this sector.

At the Federal level, computer operations was the organizational subunit which employed the largest number of information professionals. Nearly one-half of the information professionals in the Federal sector were in the computer workfield, primarily performing operational information functions.

The library/archives subunit was the primary organizational subunit of colleges and universities employing information professionals and the library workfield was the dominant type of activity reported for this sector. Occupational titles dealing with the management of libraries constituted the largest cluster of occupational titles in the library workfield. Although the library workfield was dominant in colleges and universities, the survey showed a great deal of diversity in the types of subunits in that sector employing information professionals. Of course, colleges and universities are diversified communities and in many ways they reflect society as a whole. The larger the institution, the more diversified its interests. It is not uncommon for large research universities to be involved in computing, databanks, public relations, libraries and archives, planning units, management information systems, medical records centers, records centers in general, audio-visual media, financial analysis, administrative services, and so on, all of which were represented by reported subunits. ☐

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* For a detailed statement on the organizations excluded in each of the four sectors surveyed, see "Notes and References : Chapter One "or any of the statistical tables.

Chapter Three
INFORMATION PROFESSIONALS IN THE UNITED STATES

The objective of the Occupational Survey of Information Professionals was to estimate the number of information professionals employed by organizations in industry, government (Federal and state and local), and higher education. Since this project involved estimates of persons engaged in performing information functions and not individual attitudes or opinions, the study was designed to survey organizations, not individuals. The survey population of organizations was stratified as shown in Table 1.

As can be seen from the footnotes to Table 1, not all organizations were included in the universe from which the sample was chosen. The principal units omitted were organizations with fewer than fifty employees, the courts, the White House, intelligence agencies of the Federal government, and a portion of the nation's banking industry. Military personnel were also excluded. Thus, estimates of information professionals are lower than the true number by an unknown amount. Also, many professionals working in information-intensive occupations did not meet the definition of an information professional as stated in Chapter Two and were therefore excluded from the survey. Among this group were managers (other than managers of information programs and services), newspaper reporters and editors, teachers, and similar professionals who were regarded either as generators of information or primary users of information rather than as information professionals.

It is estimated from the survey responses that there are over 1.64 million information professionals in the United States. The number employed varies substantially for each of the four employment sectors surveyed, and this variation is shown in Table 2. This table also gives estimates of the number of information professionals employed in each sector, together with an estimate of the standard errors.[1] Industry reported the largest number of information professionals, employing about 1.16 million or approximately seven out of every ten employed. State and local governments followed with 370,500 information professionals, or about two out of every ten employed. Estimates for the Federal government were about 78,900 information professionals employed (keeping in mind that military personnel and persons employed by intelligence and some

Table 1. SAMPLE SIZE AND NUMBER OF RESPONSES BY SECTOR IN THE OCCUPATIONAL SURVEY OF INFORMATION PROFESSIONALS 1980

SECTOR	Original Sample Size	Proportion of Total Mailed	Number of Responses	Proportion of Total Responses
Industry[1]	1,607	.68	878	.74
State & Local Government[2]	329	.14	166	.14
Federal Government[3]	152	.06	46	.04
Colleges & Universities[4]	270	.12	103	.08
Total:	2,358	1.00	1,193	1.00

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Table 2. NUMBER OF INFORMATION PROFESSIONALS BY THEIR SECTOR OF EMPLOYMENT

SECTOR	Number of Information Professionals	Standard Error	Proportion of Information Professionals (%)
Industry[1]	1,161,500	213,900	71
State & Local Government[2]	370,500	65,800	22
Federal Government[3]	78,900	21,800	5
Colleges & Universities[4]	30,100	5,100	2
Total:	1,641,000	224,000	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

other agencies were excluded). Colleges and universities reported only 30,100 information professionals.

Primary Information Functions Performed by Information Professionals

The number and proportion of information professionals performing each of the nine primary information functions discussed in Chapter Two are given in Table 3.

Of the 1.64 million information professionals in the United States, nearly 390,000 (25% of those whose function was specified) were engaged in information systems analysis and design, or in information research and development. About 43,000 (3% of those in specified functions) teach or train information workers, and over one-quarter million manage information operations, programs, or services. This means that about one in six information professionals is engaged in management. Over one-half million professionals serve in the information transfer processes of preparation and analysis of data or information on behalf of others, or in searching for data or information on behalf of others, with about 92,000 persons in the latter category. In addition, a further quarter million professionals perform operational information functions such as library acquisitions, developing software packages for computer users, and so on. It was found that these proportions varied substantially among the four sectors of employment surveyed.

Table 4 shows the number of information professionals by primary information function performed and by sector of employment. Some insight into what information professionals do in each of the sectors can be got from examining the rows in Table 4 . For instance, in the Federal sector the majority of professionals are involved in the operational aspect of information handling, in data or information analysis on behalf of others, in searching for data or information on behalf of others, and in systems analysis. In state and local governments, most professionals are managing information operations, preparing data or information for others, and analyzing material on behalf of others. In colleges and universities, management and supervisory functions dominate, along with education and training of information workers. The primary activities in industry are systems analysis, operational information functions, data or information analysis, and the management of information operations.

Almost half of the information professionals reported had their primary work responsibility in one of three functions: (1) management activities, (2) operational information functions, and (3) information systems analysis. Each of these functions employed about one in six information professionals and together they accounted for about half of the returns from establishments surveyed. Table 4 shows that the pattern was not consistent over the four sectors. Although the management function dominated the list in terms of total numbers employed, it was the leading function only in state and local governments, and in colleges and universities. In the other two sectors, the functions on which the greatest number of information professionals spent more than fifty percent of their time were

Table 3. NUMBER OF INFORMATION PROFESSIONALS BY THEIR PRIMARY INFORMATION FUNCTION PERFORMED: 1980

INFORMATION FUNCTIONS	Number of information professionals	Standard Error	Proportion of information professionals (%)
Information Management	273,900	26,100	17
Data/Information Preparation for Others	213,500	36,800	13
Data/Information Analysis for Others	257,100	35,300	15
Searching on Behalf of Others	92,000	10,000	6
Information Systems Analysis	265,800	60,600	16
Information Systems Design	103,400	25,100	6
Other Operational Information Functions	272,700	112,800	17
Educating/Training Information Workers	42,800	7,300	3
Information Research and Development	20,700	6,900	1
Other Information Functions	5,700	2,600	1
Function Not Specified	93,400	42,700	6
Total:	1,641,000	224,000	101[a]

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

[a] Percentages do not add to 100 percent due to rounding of figures

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

Table 4. NUMBER OF INFORMATION PROFESSIONALS BY THEIR SECTOR OF EMPLOYMENT AND BY THEIR INFORMATION FUNCTIONS PERFORMED: 1980

SECTOR OF EMPLOYMENT	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Industry[1]	176,200 (18,900)[a]	119,600 (18,800)	177,900 (23,200)	53,600 (10,600)	236,200 (60,900)	87,300 (24,700)	209,300 (113,700)	22,200 (4,400)	16,700 (7,300)	3,200 (2,100)	59,300 (37,300)	1,161,500 (213,900)
State & Local Government[2]	83,800 (17,000)	78,800 (33,300)	59,700 (16,400)	32,400 (2,300)	16,300 (4,900)	8,800 (3,500)	38,300 (9,300)	14,100 (5,200)	3,800 (2,000)	1,100 (650)	33,400 (28,800)	370,500 (65,800)
Federal Government[3]	6,600 (1,800)	11,500 (3,000)	18,100 (3,500)	4,300 (1,900)	10,900 (3,800)	6,200 (2,700)	18,500 (10,600)	1,100 (650)		1,300 (150)	400 (350)	78,900 (21,800)
Colleges and Universities[4]	7,300 (1,800)	3,600 (800)	1,400 (200)	1,700 (250)	2,400 (250)	1,100 (150)	6,600 (650)	5,400 (2,300)	200 (75)	100 (50)	300 (250)	30,100 (5,100)
Total:	273,900 (26,100)	213,500 (36,800)	257,100 (35,300)	92,000 (10,900)	265,800 (60,600)	103,400 (25,100)	272,700 (112,800)	42,800 (7,300)	20,700 (6,900)	5,700 (2,600)	93,400 (42,700)	1,641,000 (224,000)

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

[a] Standard errors are given in parentheses for each cell

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the U.S. banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by the Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges and Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

systems analysis in industry, and operational information functions in the Federal sector.

Some general observations can be made from the survey results. First, many more persons appear to be engaged in educating and training information workers in industry (22,200) and government (14,100) than in colleges and universities (5,400). Second, one would expect the proportion of managers to total information professionals to remain fairly consistent since they partially represent those they manage. However, this proportion varied somewhat among the sectors. The proportion is lowest in the Federal government (9% of those with function specified), followed next by industry (16%), state and local government (25%), and colleges and universities (25%).The proportion of information professionals in specified functions that is searching on behalf of others is fairly consistent among the sectors, ranging from five to ten percent. The number of information professionals engaged in research and development is dominated by those employed in the industrial sector (81%). However, it should be noted that respondents were asked to report only their *primary* work activities. Many college and university faculty members do research in information, but not as a primary function and therefore the number actually involved in information research could be much higher than that reported in the survey. The number of information professionals reported in the Federal government may also be greatly underestimated.

Workfields of Information Professionals

For ease in handling the survey data, a number of discrete "workfields" were identified and classified by aggregating job titles into nine categories (as explained in Chapter Two), for example, the computer workfield, the library workfield, and so on. The results are given in Table 5.

The predominant work environment of information professionals was the computer workfield (45% of those specified). Other workfields with over 100,000 information professionals were the management support workfield (11%), the library workfield (10%), the information services workfield (10%), the education and training workfield (9%), and the research workfield (8%). It is useful to compare these data with other known data. For instance, the survey estimate for the library workfield is 160,000 information professionals. In 1978 the Current Population Survey of the U.S. Census Bureau showed estimates of 180,000 librarians. (The CPS data are based on self-reporting, which generally overstates the number of persons within a profession.) Thus, the estimate from the Occupational Survey of Information Professionals appears to be close to the true number for this workfield.

Organizational Subunits Where Information Professionals Work

Table 6 shows the employment of information professionals in the various organizational subunits, by their sector of employment.

Table 5. NUMBER OF INFORMATION PROFESSIONALS BY THEIR WORKFIELD: 1980

WORKFIELD	Number of information professionals	Proportion of information professionals (%)
Computer	683,000	42
Education & Training	131,900	8
Financial	69,100	4
Information Services	150,500	9
Library	159,800	10
Management Support	167,600	10
Research	124,700	8
Statistical	3,900	0.1
Technical Publications	39,000	2
Other	12,800	0.9
Unspecified	98,700	6
Total:	1,641,000	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 6. NUMBER OF INFORMATION PROFESSIONALS BY THEIR ORGANIZATIONAL SUBUNIT AND THEIR SECTOR OF EMPLOYMENT: 1980

SUB-UNIT	SECTOR				TOTAL
	Industry[1]	State/Local Govt.[2]	Federal Govt.[3]	Colleges & Universities[4]	
Abstracting/Indexing	4,600	-	400	100	5,100
Administrative Services	9,200	14,600	2,800	900	27,500
Audio-Visual Media	300	5,100	500	600	6,500
Command & Control	-	-	1,000	-	1,000
Communications	2,600	4,400	*	-	7,000
Computer Operations	357,900	13,200	22,800	2,200	396,100
Databank/Database	11,800	700	1,800	100	14,400
Extension/Outreach	400	1,200	22,800[5]	-	24,400[5]
Financial Analysis	19,800	12,400	500	500	33,200
In-Company Training	3,300	7,000	700	*	11,000
Information Analysis	6,000	3,000	1,000	200	10,200
Library/Archives	35,900	77,900	3,900	8,200	125,900
Management Info. System	77,700	24,400	7,700	200	110,000
Medical Records	6,800	300	100	100	7,300
Public Information/P.R.	6,100	3,300	1,100	300	10,800
Research/Analysis/Planning	60,500	19,000	3,600	800	83,900
School/Academic Dept.	3,500	500	-	3,400	7,400
Systems Analysis/Prog.	246,100	27,700	16,200	4,200	294,200
Technical Information	15,800	19,700	1,700	100	37,300
Technical Reports Prepn.	27,000	1,200	600	*	28,800
Other	45,400	125,000	5,500	500	176,400
Unspecified	220,800	9,900	200	7,700	238,600
Total:	1,161,500	370,500	78,900	30,100	1,641,000

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 50 reported

Abbreviations: Info. = Information; P.R. = Public Relations; Dept. = Department; Prog. = Programming
Prepn. = Preparation

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

(5) Includes 16,000 Extension agents from the Department of Agriculture known to exist but not chosen in the sample. (Reference: *1980 Budget Explanation Notes, Department of Agriculture, Science and Education Administration*, "Status of Program", page 199, para. 2.) The 16,000 figures is not added into the totals, in order to achieve consistency.

Computer operations was the largest organized subunit to employ information professionals. Nearly 400,000, or one in three of those in identified subunits, was employed in this subunit. The related subunit of systems analysis/programming accounted for nearly 300,000, or about 24 percent of those in identified subunits. Industry employed 90 percent of those in computer operations and 84 percent of those in systems analysis/programming subunits. One-quarter million information professionals were not associated with any of the subunits identified for this study; almost all of these--93 percent--were in the industrial sector.

The library/archives subunit and the management information systems subunit were the only other subunits employing over 100,000 information professionals. State and local governments were the largest employers of information professionals in terms of absolute numbers in this subunit, but colleges and universities employed a relatively larger proportion of their information professionals in the library/archives subunit. Those employed in the management information systems subunit were found mainly in industry (70%) and in state and local governments, (22%).

Information professionals in their reported subunits were distributed by information function performed as shown in Table 7. The 396,100 information professionals in computer operations subunits were primarily performing operational information functions (43% of those performing identified functions), information systems analysis (19%), and analyzing data or information on behalf of others (16%). The 294,200 information professionals in the systems analysis/programming subunit were principally involved in systems analysis and design (52%), operational information functions (18%), and information management (14%).

The library/archives subunit reported 30 percent of those information professionals performing identified functions as being engaged in management functions, 27 percent searching for data or information for others, and 19 percent preparing data or information for others. The 110,000 information professionals in the management information system subunits were primarily managing information (36%) and analyzing data or information on behalf of others (27%).

The remaining subunits had fewer than 100,000 information professionals in each.

The distribution of information professionals by their workfield over the four sectors is given in Table 8. The computer workfield dominates the industrial and Federal sectors, with 56 percent and 49 percent of the information professionals reported in identified workfields. The proportion for colleges and universities, and for state and local governments, is 25 percent and 12 percent, respectively.

The management support workfield was the work environment for 17 percent of the information professionals in the Federal sector, but for only 11 percent or fewer in all other sectors. The library workfield provided employment for

Table 7. NUMBER OF INFORMATION PROFESSIONALS BY THEIR ORGANIZATIONAL SUB-UNIT AND BY THEIR PRIMARY INFORMATION FUNCTION PERFORMED: 1980

SUBUNIT	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Abstracting/Indexing	50	4,600	400				*					5,050
Administrative Serv.	7,500	3,800	4,200	1,500	4,100	1,000	800	1,600	1,900	300	1,000	27,700
Audio-Visual Media	2,200	1,200	1,500	*			1,500	*				6,400
Command & Control	150	100	400	*			300					950
Communications	3,200	1,400	200	150	700	300	500	*	600			7,050
Computer Operations	35,000	19,800	64,300	4,500	74,500	21,300	168,300	1,200	4,600	1,700	900	396,100
Databank/Database	800	4,100	2,700	3,700	1,400	800	800	200				14,500
Extension/Outreach	250	3,100	2,900	100			18,000[a]					24,400[a]
Financial Analysis	13,800	3,600	12,000	150	1,000	700	300	100	100		1,600	33,350
In-Company Training	500		300			300		9,500			500	11,100
Information Analysis	1,100	2,200	5,300	1,000	600		*					10,200
Library/Archives	37,000	22,900	6,300	33,500	600	200	20,900	1,000	1,100		2,500	126,000
Mngmt. Info. System	38,500	10,100	28,900	4,000	15,300	4,100	4,100	2,200			2,900	110,100
Medical Records	450	1,700	550	*		100	4,500					7,300
Public Info./P.R.	1,300	6,100	800	500	*			100	100	700	1,000	10,600
Research/Anal/Plng.	3,400	5,600	36,100	3,800	23,500	600	300	200	3,500	*	7,000	84,000
School/Academic Dpt.	500	200	150	*	*	*	*	6,300	100	*		7,250
Systems Analysis/Prog.	41,800	10,300	19,500	9,700	104,100	49,300	53,700	4,100	600	300	500	293,900
Technical Information	1,000	10,300	18,300	5,700	200	500	300	*	*	*	1,000	37,300
Tech. Reports Prepn.	1,300	21,400	800	3,000	*	200	500		100	1,600		28,900
Other	41,000	56,300	12,600	15,200	4,000	3,500	6,400	7,800	600	1,100	27,900	176,400
Unspecified	43,100	24,700	38,900	5,500	35,800	20,500	7,500	8,500	7,400		46,600	238,500
Total:	273,900	213,500	257,100	92,000	265,800	103,400	272,700	42,800	20,700	5,700	93,400	1,641,000

Source: *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations:

Serv. = Services; Mngmt. Info. System = Management Information System; Public Info./P.R. = Public Information/Public Relations; Research/Anal/Plng. = Research/Analysis/Planning; Prog. = Programming; Tech. Reports Prepn. = Technical Reports Preparation

* Fewer than 50 reported

[a] Includes 16,000 Extension agents from the Department of Agriculture known to exist but not chosen in the sample. (Reference: *1980 Budget Explanation Notes, Department of Agriculture, Science and Education Administration,* "Status of Program", page 199, para. 2.) The 16,000 figures is not added into the totals, in order to achieve consistency.

NOTE: See footnotes (1) to (4), Table 8, for limitations in sampling each sector.

Table 8. NUMBER OF INFORMATION PROFESSIONALS BY THEIR WORKFIELD AND BY THEIR SECTOR OF EMPLOYMENT: 1980

WORKFIELD	SECTOR				TOTAL
	Industry[1]	State/Local Govt.[2]	Federal Govt.[3]	Colleges & Universities[4]	
Computer	594,700	42,700	38,100	7,500	683,000
Education/Training	15,500	107,600	1,200	7,600	131,900
Financial	46,300	21,100	300	1,300	69,000
Information Services	83,800	53,600	12,400	700	150,500
Library	74,500	69,900	5,600	9,800	159,800
Management Support	115,900	36,800	13,600	1,400	167,700
Research	96,900	20,600	5,800	1,500	124,800
Statistical	1,400	2,400	*	100	3,900
Technical Publications	35,200	2,400	1,300	100	39,000
Other	6,700	5,600	300	100	12,700
Unspecified	90,600	7,800	300		98,700
Total:	1,161,500	370,500	78,900	30,100	1,641,000

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 100 reported

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities. 1977 -1978* , and Federally-Funded Research and Development Centers.

approximately one out of three information professionals in colleges and universities, about one out of five in state and local governments, and fewer than 10 percent in the other two sectors.

The information services (non-library) workfield was more prominent in the two governmental sectors than in industry or in colleges and universities. Sixteen percent (Federal government) and 15 percent (state and local governments) of the information professionals in these two sectors were in information services workfields. The industrial sector and the colleges and universities sector showed eight and two percent, respectively.

Table 9 distributes the 1.64 million information professionals by information function over the nine workfields. One in three of the 683,000 in the computer workfield was primarily performing analysis of information systems. Another one in four was performing operational information functions, and nearly one in five was preparing or analyzing data or information on behalf of others.

The second largest workfield was the management support workfield. The 167,600 information professionals in this workfield were primarily managing information operations, programs, services, or databases (40%), followed by data or information preparation and analysis on behalf of others (28%) and information systems design and analysis (18%).

The next two workfields in terms of information professionals employed were the library workfield and the information services (non-library) workfield. They each accounted for ten percent of the total specified. In the library workfield, data and information preparation (27%) and searching on behalf of others (24%) were the principal information functions performed. In the information services (non-library) workfield, data and information preparation and analysis on behalf of others were the primary activities of 79,300 information professionals (55%). Another 36,200 (25%) were managing information operations, services, programs, and databases.

Table 9. NUMBER OF INFORMATION PROFESSIONALS BY THEIR WORKFIELD AND BY THEIR PRIMARY INFORMATION FUNCTION PERFORMED: 1980

WORKFIELD	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Computer	70,700	26,600	99,500	19,200	220,100	80,200	157,200	1,000	2,100	2,300	4,100	683,000
Education/Training	22,000	37,900	7,800	5,800	200	300	3,700	26,500	800	*	26,900	131,900
Financial	37,800	5,700	20,100	500	1,200	600	1,800	1,100	100		200	69,100
Information Services	36,200	39,100	40,200	11,200	2,400	2,700	4,600	1,600	5,100	700	6,700	150,500
Library	32,400	42,000	14,900	38,500	900	*	27,400	100	1,100		2,500	159,800
Management Support	66,100	19,700	26,500	8,000	16,100	13,300	2,600	9,200	1,800	800	3,500	167,600
Research	3,000	3,300	43,500	4,700	10,300	1,100	400		9,300	*	49,100	124,700
Statistical	200	2,100	1,300	100		*	*		100		100	3,900
Technical Publications	1,100	29,600	500	3,100	1,300	200	200	1,000	100	1,900		39,000
Other	1,100	2,000	1,400	900	300	100	4,500	2,300	200			12,800
Unspecified	3,300	5,500	1,400	*	13,000	4,900	70,300	*			300	98,700
Total:	273,900	213,500	257,100	92,000	265,800	103,400	272,700	42,800	20,700	5,700	93,400	1,641,000

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

*Fewer than 50 reported

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

NOTES AND REFERENCES : CHAPTER THREE

1 Included with each estimate is its standard error which gives the reader a measure of the degree of precision which can be attached to each population estimate. Since these estimates were made from a statistical sample it is also possible to place confidence intervals around the estimates by employing the estimated standard errors ($s_{\bar{x}}$) as shown in the table.

To establish confidence intervals or range of values for the estimate within which we expect the true population value we are estimating, one can use the equation:

$$p(\bar{x} - ts_{\bar{x}} > \mu > \bar{x} + ts_{\bar{x}}) = .95$$

The value of t is 1.64 for a 0.90 confidence level and 1.96 for a 0.95 confidence level. The value of $s_{\bar{x}}$ (standard error) is estimated from the sample observations and is given in Table 2 for each sector estimate and the estimate of the grand total. A 0.95 confidence level means that if the sampling procedures for the survey are repeated many times, 95 percent of the estimated confidence intervals would contain the true value of the estimate for the population. To illustrate, with a standard error of 224,000 for the estimate of 1.6 million information professionals, the 0.95 confidence interval is 1,641,000 ± 439,000 or between 1,202,000 and 2,080,000 information professionals. Estimates of standard errors are provided only for Tables 2, 3 and 4 - employment sector totals, information function totals, and information functions by sector.

2 This number was felt to be quite low and attributable in part to inadequate internal distribution of the survey questionnaire in the larger institutions. While libraries and computer centers were almost always included, other subunits, e.g., administration, business, personnel, research accounting, etc., may not have been adequately covered by the survey of the larger universities.

Chapter Four
INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR

Industrial organizations were sampled from listings provided by a Dun and Bradstreet directory of organizations. Only industrial establishments having more than fifty employees (full-time and part-time) were included in the sample. Firms found in certain Standard Industrial Classifications (SICs) were also excluded. The SICs which were included in the sample (see Appendix B for full list) were grouped by low, medium, and high likelihood of employing information professionals. (The concept of "low", "medium", and "high" is discussed in footnote a, Table 10.) This type of grouping served as one stratification factor. Another stratification factor was the number of employees in a firm (50 to 99, 100 and over). Simple random sample sizes were chosen for each of the six strata based on a combination factor of total number of employees found in the stratum (given by the Bureau of Labor Statistics) and likelihood of employment of information professionals. Sample sizes and response rates are given in Table 10.

The overall response rate was fifty-five percent, when invalid responses (i.e., non-existent firms) are disregarded. Two firms were included as certainty selections; they both responded.

The total number of information professionals in the industrial sector of employment was estimated to be 1,161,500, which accounts for a very large portion (71%) of the entire community of information professionals. These information professionals are discussed below by the size of the establishments and subunits in which they work, as well as by their workfield and primary information function performed.

Size of Establishments Employing Information Professionals

The number of industrial information professionals found in establishments of various sizes, determined by number of employees, is given in Table 11. In this sector there are a large number of information professionals in large establishments (e.g., 100,000 information professionals in establishments having more than 5,000 employees) as well as small ones (e.g., 115,000 information professionals in organizations having between 51 and 100 employees). The distribution by classes of size is fairly even, although the class sizes vary substantially.

Table 10. NUMBER OF INDUSTRIAL ORGANIZATIONS, ORIGINAL SAMPLE SIZE AND RESPONSE RATES BY LIKELIHOOD OF INFORMATION PROFESSIONALS AND SIZE OF ORGANIZATIONS: 1980

Likelihood of information professionals [a]	Size of Industrial Organizations (No. of employees)	Total Number of organizations in D & B [b]	Original Sample [c]	Number of responses
High	50 - 99	4,476	110	35
High	> 99	4,319	190	99
Medium	50 - 99	8,721 [d]	100	60
Medium	> 99	12,400	360	127
Low	50 - 99	88,059	280	167
Low	> 99	75,918	680	389
Total		193,893	1,720	878

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

[a] The likelihood that firms employed information professionals was determined directly by judgment. Firms in certain Standard Industrial Classification (SIC) categories were judged to have high, medium, or low likelihood of employing information professionals. Libraries and information centers; publishers; management, consulting, and public relations services were all examples of firms with SIC classifications thought likely to employ information professionals. Examples of firms with low likelihood were: mining; machinery; greeting card publishers; etc. Examples of firms with medium likelihood were: banks; insurance agencies; schools; and so on. The complete list of SIC classifications included in the survey sample, and for which estimates of total population are made, is given in Appendix B to this report.

[b] Dun & Bradstreet

[c] including invalid organizations

[d] estimated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

Table 11. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY SIZE OF THEIR INDUSTRIAL ESTABLISHMENT: 1980

Number of Employees in Establishment	Number of Information Professionals	Proportion of Information Professionals (%)
50 or fewer [a]	48,900	4
51 - 100	114,600	10
101 - 250	155,200	13
251 - 500	153,600	13
501 - 1,000	278,000	24
1,001 - 2,500	150,100	13
2,501 - 5,000	66,400	6
More than 5,000	130,100	9
Unknown	94,600	8
Total	1,161,500	100

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

[a] Some organizations reported having fewer than fifty employees even though those identified in the Dun and Bradstreet listings were not included in the sample.

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

The information professionals performing information functions in the industrial sector were grouped according to the size of establishment in which they were employed, as shown in Table 12. The industrial establishments employed information professionals over the entire range of information functions, even when these establishments had fewer than fifty employees. An exception was found in establishments employing 2,501 to 5,000 persons, which did not report information professionals performing either the education/training function or the information research and development function. This may be attributable to sampling error, or to a definitional misunderstanding which resulted in persons performing these functions being reported under a different function.

Small establishments (fewer than 250 employees) differed from large establishments (more than 1,000 employees) with regard to the management function. The smaller establishments had a relatively large proportion of their information professionals (25%) managing information operations, compared with larger establishments which had only ten percent of their information professionals performing this function.

Most of the professionals performing information systems analysis and information systems design in the industrial sector were from the moderate-to-large establishments (with over 250 employees).

In-company training of information workers, and information research and development were not common in establishments with 2,500 or more employees. It may be that such establishments are so large that training of information workers and information research work are specialised functions which are performed at separate locations.

Organizational Subunits Where Information Professionals Work

In Table 13 it is shown that the largest number of industrial information professionals work in computer operations (357,900) which represents 40 percent of those in specified subunits. A related subunit, systems analysis/programming, has another 246,100 information professionals, and the two subunits account for two out of every three information professionals in industry. Other large subunits include management information systems (77,700), research/analysis/planning (60,500), libraries (35,900), and technical reports preparation (27,000).

In the main employment subunit for information professionals in industry--computer operations--the primary function was operational: controlling and supervising data input to systems. This function was performed by 41 percent of the information professionals in computer operations and by 19 percent in systems analysis/programming. Those primarily involved with the systems analysis function were also employed in large numbers in these two subunits, 72,100 and 85,800 respectively, which translates into 20 percent and 35 percent, respectively, of the totals in these subunits. (See Table 14.)

Table 12. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY SIZE OF THEIR ESTABLISHMENT AND BY THEIR PRIMARY INFORMATION FUNCTION PERFORMED: 1980

NUMBER OF EMPLOYEES	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
50 or fewer[a]	18,400	5,500	10,100	4,900	2,300	1,900	4,200	1,100	500			48,900
51 - 100	18,900	18,800	25,200	12,100	8,300	3,800	16,800	5,000	1,200	1,000	3,500	114,600
101 - 250	38,300	27,400	29,500	6,200	16,700	4,700	14,500	6,400	2,600	1,600	7,300	155,200
251 - 500	38,600	22,500	23,500	5,700	22,300	8,300	13,100	6,000	6,300	600	6,700	153,600
501 - 1,000	27,300	19,900	36,200	3,400	80,200	19,700	46,200	3,100	200		41,800	278,000
1,001 - 2,500	12,900	12,800	35,800	5,000	46,300	20,600	10,600	200	5,900			150,100
2,501 - 5,000	8,300	4,200	7,400	5,800	21,100	7,700	11,900					66,400
More than 5,000	10,600	2,700	9,200	9,500	29,000	15,700	23,000	400				100,100
Unknown	2,900	5,800	1,000	1,000	10,000	4,900	69,000					94,600
Total	176,200	119,600	177,900	53,600	236,200	87,300	209,300	22,200	16,700	3,200	59,300	1,161,500

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

[a] Some organizations reported having fewer than fifty employees even though those so identified in the Dun and Bradstreet listings were not included in the sample

Note. Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Table 13. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN INDUSTRY BY SUBUNITS OF ORGANIZATION: 1980

SUBUNIT	Number of Information Professionals	Proportion of Information Professionals (%)
Abstracting and Indexing	4,600	0.4
Administrative Services	9,200	0.7
Audio-Visual Media	300	*
Communications	2,600	0.2
Computer Operations	357,900	30
Databank/Database	11,800	1
Extension/Outreach	400	*
Financial Analysis	19,800	2
In-Company Training	3,300	0.2
Information Analysis	6,000	0.5
Library/Archives	35,900	3
Management Information System	77,700	7
Medical Records	6,800	0.5
Public Information/Public Relations	6,100	0.5
Research/Analysis/Planning	60,500	5
School/Academic Department	3,500	0.2
Systems Analysis/Programming	246,100	20
Technical Information	15,800	1
Technical Reports Preparation	27,000	2
Other	45,400	4
Unspecified	220,800	18
Total	1,161,500	100

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

* Less than 0.1 percent

NOTE: The Industry sector does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Industrial Classifications deemed unlikely to employ information professionals, and portion of the U.S. banking industry

Table 14. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNIT AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

SUBUNIT	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/information preparation on behalf of others	Data/information analysis on behalf of others	Searching for data/information on behalf of others	Information systems analysis	Information systems design	**Operational information functions**	Education/training of information workers	Information research and development	Other information functions	Function not specified	
Abstracting/Indexing		4,200	400									4,600
Administrative Services	3,100	500	300	500	3,300	200	300	1,000				9,200
Audio-Visual Media		200					100					300
Command & Control												–
Communications	200	*	200	100	700	300	500	*	600			2,600
Computer Operations	31,500	18,000	63,700	2,100	72,100	18,600	144,300	1,000	4,600	1,400	600	357,900
Databank/Database	700	3,100	2,100	2,800	1,400	800	700	200				11,800
Extension/Outreach		200		100			100					400
Financial Analysis	11,500	2,500	3,900	100	800	500	100	100	100		200	19,800
In-Company Training	500							2,800				3,300
Information Analysis			4,600	800	600							6,000
Library/Archives	8,300	9,100	6,000	9,100		200	3,200					35,900
Management Info. System	28,200	5,200	18,200	3,200	12,200	4,000	2,600	2,200			1,900	77,700
Medical Records	400	1,400	500				4,500					6,800
Public Information/PR	700	3,600		600				100	100		1,000	6,100
Research/Analysis/Plng.	2,400	4,300	18,200	2,900	22,200	500	100	200	3,100		6,600	60,500
School/Academic Dept.								3,500				3,500
Systems Analysis/Prog.	35,300	7,900	16,500	9,500	85,800	40,400	45,400	4,000	600	200	500	246,100
Technical Information	400	3,700	5,800	4,300	100	500					1,000	15,800
Technical Reports Prepn.	1,100	20,300	400	2,900	*	200	500			1,600		27,000
Other	13,400	13,400	1,700	9,600	1,700	1,400	800	1,600	600		1,200	45,400
Unspecified	38,500	22,000	35,400	5,100	35,200	19,700	6,100	5,500	7,000		46,300	220,800
Total	176,200	119,600	177,900	53,700	236,100	87,300	209,300	22,200	16,700	3,200	59,300	1,161,500

Source: *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

***Fewer than 50 reported**

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

The third largest subunit in terms of information professionals employed was management information systems. The 77,700 information professionals in this subunit represent 9 percent of the total number of information professionals in specified subunits in the industrial sector. As might be expected, the primary information function performed in this subunit was managerial in nature (37%), followed by data and information analysis on behalf of others (24%), and information systems analysis (16%).

For those 220,800 information professionals not identified with an organizational subunit, the largest group (22%) were performing a managerial function, while 20 percent were performing data or information analysis on behalf of others, and another 20 percent were engaged in systems analysis.

The independently-organized subunits of industrial establishments were examined in relation to their size in terms of number of employees. The largest independent subunits were computer operations and systems analysis/programming. These two subunits were well represented in all sizes of establishments, as shown in Table 15. In companies of known size, a full 39 percent of the 357,900 information professionals in computer operations were found in companies with 501-1,000 employees. On the other hand, the largest proportion of information professionals in the systems analysis/programming subunit were found in firms with over 5,000 employees. Unfortunately, nearly a quarter-million information professionals in the industrial sector were not identified with any independently-organized subunits.

Even companies with fewer than fifty employees had representative numbers of information professionals in most of the identified subunits. Anomalies noted in the industrial sector were: (1) information analysis centers were found in firms with fewer than 500 employees, but none were found in larger concerns; and (2) technical reports preparation and technical information subunits were not found in concerns with more than 2,500 employees. Companies with fewer than 50 employees did not have subunits in public information/public relations, in-company training, administrative services, or communications.

Workfields of Information Professionals

The industrial sector was subdivided into nine workfields (by a method detailed in Chapter Two), as shown in Table 16.

By far the largest of these workfields in terms of numbers of information professionals was the computer workfield. It employed 594,700 or 56 percent of the information professionals in specified workfields. Only one other workfield had more than 100,000 information professionals, and that was the management support workfield, with 115,900 employed. Other workfields having significant numbers of information professionals were research (96,900), information services (non-library) (83,900), library/archives (75,000), financial (46,200), and technical publications (35,200).

Table 15. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNITS AND BY THEIR SIZE OF ESTABLISHMENT: 1980

SUBUNIT	SIZE OF ESTABLISHMENT									TOTAL
	50 or Fewer	51 - 100	101 - 250	251 - 500	501 - 1,000	1,001-2,500	2,501-5,000	More than 5,000	Size unknown	
Abstracting/Indexing	400		200	3,400		600				4,600
Administrative Services		1,600	1,000	2,100	300	100	1,000	3,100		9,200
Audio-Visual Media		300								300
Command & Control										–
Communications		400	600		200	600	100	700		2,600
Computer Operations	7,600	31,600	31,000	31,500	103,600	38,700	12,900	10,800	90,200	357.900
Databank/Database	500	3,400	1,700	700	2,400	1,200	700	1,200		11,800
Extension/Outreach			300						100	400
Financial Analysis	1,700	3,000	7,200	2,200	2,700	1,700	300	1,000		19,800
In-Company Training		200	400	2,200	200		300			3.300
Information Analysis	1,400	3,500	200	900						6,000
Library/Archives	6,800	10,200	5,700	2,600	1,400	2,700	2,000	800	3,700	35,900
Management Info. System	7,000	4,400	7,900	13,600	24,300	3,800	3,500	13,200		77,700
Medical Records	2,100		400	600	3,100	600				6,800
Public Information/PR		900	400	1,200	2,300		1,300	*		6,100
Research/Analysis/Plng.	7,200	4,200	14,300	4,900	24,200	3,500	200	2,000		60,500
School/Academic Dept.		3,500								3,500
Systems Analysis/Prog.	3,100	9,300	21,600	30,500	49,300	39,500	25,200	67,000	600	246,100
Technical Information	200	3,000	2,000	4,400		6,200				15,800
Technical Reports Prepn.	1,600	2,500	8,800	10,600	400	3,100				27,000
Other	5,100	8,000	21,000	2,400	1,400	1,700	5,500	300		45,400
Unspecified	4,200	24,600	30,500	39,800	62,200	46,100	13,400	*		220,800
Total	48,900	114,600	155,200	153,600	278,000	150,100	66,400	100,100	94,600	1,161,500

Source. *Occupational Survey of Information Professionals 1980,* University of Pittsburghin conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation
***Fewer than 50 reported**

NOTE **Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.**

Table 16. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR WORKFIELD: 1980

WORKFIELD	Number of Information Professionals	Proportion of Information Professionals (%)
Computer	594,700	51
Education/Training	15,500	1
Financial	46,200	4
Information Services	83,900	7
Library	74,500	7
Management Support	115,900	10
Research	96,900	8
Statistical	1,400	*
Technical Publications	35,200	3
Other	6,700	*
Unspecified	90,600	8
Total	1,161,500	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

These workfields break down by primary information function performed as shown in Table 17. In the largest workfield--the computer workfield--one out of three was an information systems analyst, one out of five was performing operational functions such as supervising or controlling the input of data to information systems, and one in six was performing data or information analysis on behalf of others.

The second largest workfield was management support, with over 115,000 information professionals, or 11 percent of the total in specified workfields. Nearly half (45%) were performing the information management function, followed by information analysis on behalf of others (13%), systems analysis (12%), and systems design (11%). None of the remaining workfields employed more than 9 percent of the information professionals reported in the industrial sector.

As the computer workfield was reported as employing over half of the information professionals in the industrial sector, it warrants more detailed examination. Table 18 organizes the computer workfield into work activities, and crosstabulates these activities with subunits.

The primary work activity of nearly 250,000 information professionals in computer operations subunits was operational in nature, with 40 percent engaged in this activity. The next largest work activity in terms of information professionals employed was programming/software development, with 32 percent of the total reported in specified subunits. The other major subunit in the computer workfield was systems analysis/programming, where the primary work activities were systems analysis and programming/software development. These two work activities were the primary responsibility of 42 and 27 percent, respectively, of the information professionals in this subunit.

The remaining subunits, and the number of information professionals performing the work activities in these subunits are shown in Tables 19 to 22.

Of the 115,900 information professionals in the management support workfield, nearly half were not identified with a specific subunit. Most of these, three out of four, were performing management functions. The largest group identified with a subunit was in management information systems, where nine out of ten of the information professionals were involved in management activities. All 11,900 information professionals in the systems analysis/programming subunit of the management support workfield were managing computer services or systems.

Over half of the 96,900 information professionals in the research workfield were not identified with a specific subunit. Nine out of ten, even though not attached to a subunit, were reported as being primarily responsible for research in general. The only identified subunit with a sizeable information professional component was research/analysis/planning. This subunit employed two out of three of the information professionals in the research workfield, with the majority (73%) doing research and analysis work.

Table 17. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR WORKFIELD AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

WORKFIELD	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/information preparation on behalf of others	Data/information analysis on behalf of others	Searching for data/information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/training of information workers	Information research and development	Other information functions	Function not specified	
Computer	60,600	22,700	96,400	17,400	199,700	67,900	122,600	600	2,100	1,100	3,700	594,800
Education/Training	1,000	700		*	200	*	900	12,500	200			15.500
Financial	30,500	2,900	7,900	500	1,100	400	1,500	1,000	100		200	46,100
Information Services	20,800	19,200	20,800	8,200	1,100	500	1,000	1,600	5,000		5,700	83,900
Library	7,500	28,300	14,500	15,200	400		8,600					74,500
Management Support	51,400	10,200	14,700	5,000	13,200	12,400	1,300	5,500	500	500	1,200	115,900
Research	1,500	900	22,700	4,000	9,400	1,000	100		8,800		48,500	96,900
Statistical	200	900	300									1,400
Technical Publications	800	27,100	*	3,100	1,300	100	200	1,000		1,600		35,200
Other		1,400	600	200			4,500					6,700
Unspecified	1,900	5,300			9,800	5,000	68,600	*				90,600
Total	176,200	119,600	177,900	53,600	236,200	87,300	209,300	22,200	16,700	3,200	59,300	1,161,500

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 50 reported

NOTE **Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.**

Table 18. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNITS AND BY THEIR COMPUTER WORKFIELD: 1980

SUBUNIT	COMPUTER WORKFIELD						TOTAL
	Management of DP/Computer Systems and Services	Computer Operations	Computer User Liaison	Data Operations	Programming/ Software Development	Systems Analysis/ Design	
Administrative Services	400			200	100	3,300	4,000
Communications	*		*	100		500	600
Computer Operations	20,300	99,900	600	9,100	79,700	40,000	249,600
Databank/Database	200	300		4,300		400	5,200
Financial Analysis		300	400		200	500	1,400
Information Analysis	*					3,900	3,900
Library/Archives							-
Management Info. System	5,100	1,400		1,600	1,600	14,000	23,700
Medical Records							-
Public Information/PR	*						*
Research/Analysis/Planning		1,600		*	1,000	13,700	16,300
School/Academic Dept.							-
Systems Analysis/Prog.	13,600	16,300	7,600	22,500	57,200	97,000	214,200
Technical Information							-
Technical Reports Prepn.		200			500	200	900
Other			400		100	6,700	7,200
Unspecified	900	26,300	100	3,400	17,400	19,400	67,500
Total	40,500	146,300	9,100	41,200	157,800	199,600	594,500

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

*Fewer than 50 reported

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Table 19. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNITS AND BY THEIR MANAGEMENT SUPPORT WORKFIELD: 1980

SUBUNITS	MANAGEMENT SUPPORT WORKFIELD						TOTAL
	Management Analysis/ Services	Administrative Systems and Services	File and Records Management	Personnel Information Systems	Planning Information Systems	Marketing Information Systems	
Administrative Services	200	1,500		1,300			3,000
Audio-Visual Media							-
Command & Control							-
Communications	100				300		400
Computer Operations	1,000	2,600		800		200	4,600
Databank/Database				200			200
Financial Analysis	2,900					100	3,000
In-Company Training				800			800
Information Analysis							-
Library/Archives	200						200
Management Information System	27,700	100		100	2,900	500	31,300
Medical Records			200				200
Public Information/PR							-
Research/Analysis/Planning	400	200				700	1,300
Systems Analysis/Programming	11,900						11,900
Technical Information	1,200						1,200
Technical Reports Preparation	500						500
Other	13,500	200		200	4,400	1,900	20,200
Unspecified	29,700	2,500		400	600	3,900	37,100
Total	89,300	7,100	200	3,800	8,200	7,300	115,900

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

NOTE **Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.**

Table 20. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNITS AND BY THEIR RESEARCH WORKFIELD: 1980

SUBUNITS	RESEARCH WORKFIELD					TOTAL
	Management of Research	Research - General	Research - Institutional	Information/ Research Analysis	Program and Equipment Evaluation	
Administrative Services						-
Audio-Visual Media						-
Communications				600	100	700
Computer Operations		2,900				2,900
Financial Analysis						
In-Company Training						-
Information Analysis						-
Library/Archives		900				900
Management Information System				2,200		2,200
Public Information/PR						-
Research/Analysis/Planning	600	7,400		21,800		29,800
School/Academic Department						-
Systems Analysis/Programming		2,100				2,100
Technical Information		700				700
Other		100		3,500	1,700	5,300
Unspecified	100	48,200		4,000		52,300
Total	700	62,300		32,100	1,800	96,900

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

As in the management support workfield and the research workfield, a large number, 31,300 or 37 percent of the total, in the information services (non-library) workfield were not identified with any particular subunits of the organization. Nearly half of these information professionals were dealing with technical information. The largest identified subunit was management information systems where most were managing information services. The next largest subunit was the technical information unit where all of the information professionals in the subunit were involved with technical information. Data on the information services (non-library) workfield are displayed by activity and subunit in Table 21.

Of the 57,700 information professionals in known subunits in the library workfield of the industrial sector, 32,700 or 56 percent worked in libraries or archives. Their primary work activities were searching and reference work (36%), subject specialty (29%), management of information (22%), and technical services (13%). A total of 12,200 information professionals in this workfield were not identified with a subunit of the establishment. The majority of these were in technical services; another 4,200 or one in three were in subject specialties.

The second largest group identified within a subunit was of those professionals in the databank/database subunit. They numbered 6,200 and were distributed over three work activities, as follows: technical services (40%), subject specialty (34%), and searching and reference (26%).

Occupational Titles of Information Professionals

Tables 23 through 27 show the results of a crosstabulation of the occupational title groups in each workfield with the information functions performed. This type of analysis shows which information functions are performed by which groups of professionals with similar occupational titles, and indicates (or at least suggests) the relationship or lack of relationship between the occupational titles and the information functions actually performed. Each of these relationships is analyzed for the major information workfields in the industrial sector.

Occupational titles grouped under systems analysis/design numbered 199,900. This represented 34 percent of the total number of information professionals projected for the computer workfield. Within this title group, 68 percent were performing the information systems analysis function, followed by another 18 percent engaged in information systems design.

The second largest group of information professionals was found in the occupational title group called programming/software development. This group numbered 157,900 and represented 27 percent of the total number of information professionals with identified functions in the workfield. Forty-two percent of the professionals in this title group were supervising or controlling data input to information systems. Another 28 percent were engaged in information systems analysis, followed by 17 percent working on information systems design.

Table 21. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNIT AND BY THEIR INFORMATION SERVICES WORKFIELD: 1980

SUBUNITS	INFORMATION SERVICES WORKFIELD							TOTAL
	Managing information services/	Marketing information services/	Educational information	Government information	Health/Legal/ Welfare information	Public & Consumer information	Scientific & Technical information	
Administrative Services	200							200
Audio-Visual Media								-
Communications	400	100					400	900
Computer Operations	400						4,400	4,800
Databank/Database								-
Extension/Outreach			300				100	400
Financial Analysis								-
Information Analysis	200							200
Library/Archives	200						1,200	1,400
Management Info. System	12,700					*		12,700
Medical Records	400							400
Public Information/PR						5,800		5,800
Research/Analysis/Planning							9,100	9,100
Systems Analysis/Prog.	2,200						1,100	3,300
Technical Information							11,100	11,100
Technical Reports Prepn.							2,300	2,300
Other	800	500	1,000			300	1,200	3,800
Unspecified	5,600	1,700	600			6,800	12,800	27,500
Total	23,100	2,300	1,900			12,900	43,700	83,900

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Prog. = Programming; Prepn. = Preparation

*Fewer than 50 reported

NOTE industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Table 22. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR ORGANIZATIONAL SUBUNITS AND BY THEIR LIBRARY WORKFIELD: 1980

SUBUNIT	LIBRARY WORKFIELD							TOTAL
	Library management	Archives management	Bibliography	Library systems automation	Reference and searching	Subject specialty	Technical services	
Abstracting/Indexing						100	4,500	4,600
Administrative Services	100							100
Audio-Visual Media								–
Communications					*			*
Computer Operations					400	400	1,700	2,500
Databank/Database					1,600	2,100	2,500	6,200
Information Analysis					800	1,100		1,900
Library/Archives	7,100			100	11,700	9,500	4,300	32,700
Management Info. System						1,200	600	1,800
Medical Records								–
Public Information/PR								–
Research/Analysis/Planning						1,600	100	1,700
School/Academic Dept.								–
Systems Analysis/Prog.					200	200	4,400	4,800
Technical Information						800	400	1,200
Technical Reports Prepn.							200	200
Other	*				1,200	1,600	1,800	4,600
Unspecified	300				500	4,200	7,200	12,200
Total	7,500			100	16,400	22,800	27,700	74,500

Source: *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

***Fewer than 50 reported**

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry

The third largest group of information professionals was in the occupational title group computer operations, representing one in four information professionals with known functions in the computer workfield. The 146,200 information professionals in computer operations were reported as performing data or information analysis on behalf of others (54%), operational information functions (26%), management of information operations (7%), and information systems analysis functions (7%).

Nearly nine out of ten of the 115,900 information professionals in the management support workfield were grouped by job title into the management services/management analysis group. Slightly over half of the individuals in this group were performing management functions. The remaining functions being performed by persons in this occupational title group were systems design (13%), data analysis on behalf of others (13%), and systems analysis (11%).

Occupational titles of the 96,900 information professionals in the research workfield of the industrial sector were concentrated in general research, which accounted for 62,200 information professionals or 64 percent of those in this workfield. While involved to varying degrees in most of the functions, the majority (72%) of the information professionals were reported as not having primary responsibility for any of the primary information functions identified for this survey.

Those information professionals with titles grouped under information analysis/research analysis numbered 28,500 or 29 percent of the total. Within this group of occupational titles, the primary information functions performed were data and information analysis on behalf of others (46%), and information systems analysis (26%).

The largest group of information professionals in the information services (non-library) workfield had occupational titles grouped under technical information, giving a total of 43,700, or one out of every two information professionals in this workfield. Table 26 shows that these professionals were performing all of the information functions, with the exception of the education/training function. The largest number were analyzing data or information on behalf of others (39%). The 12,900 information professionals with titles relating to public and consumer information were mainly engaged in preparing data and information on behalf of others (81%).

The library workfield in the industrial sector numbered 74,500 information professionals. The primary grouping of occupational titles in this workfield related to subject specialty, e.g., cartography. The 22,700 in this occupational title group represented 30 percent of the total information professionals in the library workfield. The primary function of subject specialists was data and information analysis on behalf of others. Reference librarians and other searchers numbered 16,500 in the industrial sector, their primary function being that of searching for data and information on behalf of others, which accounted for three out of every four professionals in this group.

Table 23. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR OCCUPATIONAL TITLE GROUP (COMPUTER WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Computer Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management of DP/ Computer Systems and Services	27,400	7,000	900	100	1,900	1,000	2,300					40,600
Computer Operations	10,700	5,300	79,100	600	10,500	1,000	37,300		200	900	600	146,200
Computer User Liaison	300		5,100		3,200	400	200					9,200
Data Operations	8,600	4,700	900	9,000	5,900	3,500	8,100		200			40,900
Programming/Software Development	12,300	2,400	1,800	1,700	43,600	27,400	66,800	600	1,000	200	200	158,000
Systems Analysis/ Design	1,300	3,300	8,600	6,000	134,600	34,600	7,900		700		2,900	199,900
Total	60,600	22,700	96,400	17,400	199,700	67,900	122,600	600	2,100	1,100	3,700	594,800

Source ***Occupational Survey of Information Professionals 1980,*** **University of Pittsburgh in conjunction with King Research Incorporated**

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Table 24. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR OCCUPATIONAL TITLE GROUP (MANAGEMENT SUPPORT WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Management Support Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management Analysis/ Services	46,000	3,400	11,300	1,500	10,400	11,500	1,200	3,700	500			89,500
Administrative Services/ Systems	2,700		200	200	2,700	700	*			500		7,000
File and Records Management		200										200
Personnel Information Systems	700	700	200	300				1,800				3,700
Planning Information Systems	400	4,000	700	2,900		200	100					8,300
Marketing Information Systems	1,600	1,900	2,300	100	100						1,200	7,200
Total	51,400	10,200	14,700	5,000	13,200	12,400	1,300	5,500	500	500	1,200	115,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry

Table 25. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR OCCUPATIONAL TITLE GROUP (RESEARCH WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Research Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management of Research	600						*		100			700
Research - General	200	300	7,400	800	800	1,000			6,900		44,800	62,200
Research - Institutional												-
Information Analysis/ Research Analysis	100	100	15,100	3,200	8,500		100		1,400			28,500
Program and Equipment Evaluation	600	500	200	100					400		3,700	5,500
Total	1,500	900	22,700	4,100	9,300	1,000	100		8,800		48,500	96,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Table 26. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR OCCUPATIONAL TITLE GROUP (INFORMATION SERVICES WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Information Services Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Managing Information Services/Systems	15,300	1,600	5,600		400		200		100			23,200
Marketing Information Services/Systems	1,000	100					100	1,000				2,200
Educational Information	400	200	100	300	100		200	600				1,900
Government Information												-
Health/Legal/Welfare Information												-
Public and Consumer Information	700	10,500		700			*				1,000	12,900
Scientific and Technical Information	3,400	6,800	15,100	7,200	600	500	500		4,900		4,700	43,700
Total	20,800	19,200	20,800	8,200	1,100	500	1,000	1,600	5,000		5,700	83,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Table 27. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE INDUSTRIAL SECTOR BY THEIR OCCUPATIONAL TITLE GROUP (LIBRARY WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Library Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Library Management	6,700	100					700					7,500
Archives Management												-
Bibliography												-
Library Systems Automation							100					100
Reference and Searching		4,000	*	12,400			100					16,500
Subject Specialty	700	3,700	13,300	2,900	400		1,800					22,800
Technical Services	200	20,500	1,100				5,800					27,600
Total	7,600	28,300	14,400	15,300	400		8,500					74,500

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

NOTE Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

Chapter Five

INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS

The sample from state and local governments was handled somewhat differently from the samples for the other three sectors. The state and local governments sample was chosen from the U.S. Census Bureau computer tape listings entitled *1977 Census of Governments*. State governments were substratified by the following general functions:

- Natural Resources
- Libraries and Other Education
- Health
- Social Insurance Administration
- Hospitals
- Public Welfare
- State Liquor Store
- Highway
- Financial Administration
- General Control
- Corrections and Public Protection
- Water Transportation and Terminals

The total sample chosen from the above listings was 103 state agencies with 62 responses. The total estimated number of information professionals employed by state governments was 285,000, or about an average of 5,500 information professionals per state. The largest proportion of these information professionals was found in libraries and other educational institutions.

Local governments were substratified by the following types of jurisdictions:

- Counties
- Municipalities
- Townships
- Special Districts
- School Districts

A sample of 226 local governments was chosen from the listings provided by the U.S. Census Bureau and a total of 104 responses was received. The total number of information professionals found in local governments was estimated at 85,500.

Together, state and local governments were found to be the second largest employment sector of information professionals. Even so, they were a poor second, employing only about one-third of the number in the industrial sector. The number of information professionals and their composition by information function performed varies by size of employing agency, subunits in which they are found, and the work activities in which they are engaged. Each of these factors is discussed below.

Size of Agencies Employing Information Professionals

The number of information professionals found in organizations of different sizes by total number of employees is given in Table 28. A majority (73%) of the information professionals employed by state and local governments was found in small agencies, that is, agencies with 250 or fewer total employees. This fact reflects the total number of employees and the number of agencies found in the size categories.

The number of information professionals performing the various information functions identified for this survey, with agencies grouped according to size (number of employees), is shown in Table 29. It was observed that 30 percent of the 242,100 information professionals with known functions employed in the smaller agencies (under 250 employees) were performing management functions. As the size of the agency increased, the proportion of information professionals with primary responsibility for managerial activity decreased. In those agencies with over 1,000 employees, only 9 percent of the 22,200 information professionals with known functions employed were reported as managing information operations, programs, or services.

Information professionals were employed in all functions in state and local government agencies, even when the agencies had fifty or fewer employees. The management function was the one most often reported in this sector. Nearly nine out of every ten information professionals performing management functions were employed in agencies with 250 or fewer employees.

The number of agencies with 250 or fewer employees which reported information professionals responsible for the education or training of information workers was not as expected. There were over 9,000 such professionals in these smaller agencies but fewer than 500 in large agencies with over 1,000 employees. Had the numbers been proportionate to the totals, the expectation for large agencies would have been 960 in the education/training function, 50 percent larger than the number found.

Table 28. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY SIZE OF THEIR AGENCY: 1980

Number of Employees in Agency	Number of Information Professionals	Proportion of Information Professionals (%)
50 or fewer[a]	55,200	15
51 - 100	100,400	29
101 - 250	113,300	31
251 - 500	37,500	10
501 - 1,000	26,400	7
1,001 - 2,500	9,600	3
2,501 - 5,000	6,700	2
More than 5,000	7,400	2
Unknown	4,000	1
Total	370,500	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

[a] Some organizations reported having fewer than fifty employees even though those so identified on the US Census Bureau tapes were not included in the sample.

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 29. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY SIZE OF THEIR AGENCY AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

NUMBER OF EMPLOYEES IN AGENCY	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
50 or fewer[a]	19,000	6,700	14,600	6,700	2,900	200	2,200	2,400	500			55,200
51 - 100	25,900	49,900	11,900	6,500	4,100	800	8,900	600	1,800			110,400
101 - 250	27,700	12,300	13,600	14,500	1,700	2,500	6,700	7,500			26,800	113,300
251 - 500	4,500	4,900	11,700	2,000	1,100	1,700	9,900	100	1,100	500		37,500
501 - 1,000	3,800	600	2,700	1,800	3,800	700	4,300	2,900	100	400	5,300	26,400
1,001 - 2,500	600	2,500	500	100	900	500	3,100			200	1,200	9,600
2,501 - 5,000	900	700	2,100	100	500	600	900	100	200			6,700
More than 5,000	600	400	700	100	800	1,800	2,300	500	100		100	7,400
Unknown	800	800	1,300	600	500							4,000
Total	83,800	78,800	59,700	32,400	16,300	8,800	38,300	14,100	3,800	1,100	33,400	370,500

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

[a] Some organizations reported having fewer than fifty employees even though those so identified in the **U.S. Bureau of Census** listings were not included in the sample

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by the Bureau of Census *Governments Tape 1977.*

Organizational Subunits Where Information Professionals Work

The 370,500 information professionals employed by state and local governments were distributed over eighteen subunits of agencies as shown in Table 30. A large number of agencies did not report subunits (9%), or else gave a category of subunit other than one of the eighteen given in Table 30 (29%).

By far the largest of the eighteen subunits in terms of number of information professionals is the library/archives subunit, which is estimated to have 77,900 information professionals, or one-third of the total in specified subunits in this sector. This comes to an average of nearly 1,550 per state. The remaining information professionals were widely dispersed among other subunits with no type of subunit accounting for more than 12 percent of the total.

The information functions performed by information professionals in the subunits found in state and local governments are given in Table 31.

One out of three information professionals in state and local government agencies (a total of 125,000 information professionals) was not reported in one of the subunits shown in Table 31. Those not identified with a particular subunit were primarily engaged in preparing data or information on behalf of others (43%), and managing information operations (28%). Information professionals in the library/archives subunits--the largest reported--were primarily involved in management (35%) and in searching for data or information on behalf of others (30%).

In the second largest subunit of this sector, systems analysis/programming, a large proportion of information professionals (predictably) were engaged in information systems analysis; however, one in four was involved also in operational information functions (e.g., supervising or controlling data input to systems), and 17 percent were managing information operations. The largest group (41%) in the management information systems subunit was managing systems and operations; others were performing data analysis (22%) and data preparation (15%) on behalf of others.

There is also a difference in the composition of information professionals among their subunits and the size of agencies that employ them. These differences are shown in Table 32.

Nearly two out of three of those information professionals reported in a subunit were from agencies with employees numbering between 50 and 250. Independently-organized subunits exist to perform special functions within each agency, for example, to maintain records, prepare technical reports, handle computer operations, and so on.

The largest identified subunit within state and local government agencies was the library/archives subunit. One in three of the 235,600 information professionals associated with an identified subunit in this sector was working in such an area. Of those working in libraries in agencies of known size, three out of four were found in a small agency with 101-250 employees. In fact, smaller agencies (fewer

Table 30. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNITS: 1980

SUBUNITS	Number of Information Professionals	Proportion of Information Professionals (%)
Administrative Services	14,600	4
Audio-Visual Media	5,100	1
Communications	4,400	1
Computer Operations	13,200	3
Databank/Database	700	0.2
Extension/Outreach	1,200	3
Financial Analysis	12,400	3
In-Company Training	7,000	2
Information Analysis	3,000	0.8
Library/Archives	77,900	25
Management Information System	24,400	6
Medical Records	300	0.1
Public Information/Public Relations	3,300	0.8
Research/Analysis/Planning	19,000	5
School/Academic Department	500	0.1
Systems Analysis/Programming	27,700	9
Technical Information	19,700	5
Technical Reports Preparation	1,200	0.3
Other	125,000	29.1
Unspecified	9,900	2
Total	3 70,500	100

Source: *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 31. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNIT AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

SUBUNIT	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Abstracting/Indexing												–
Administrative Services	3,600	2,700	2,800	600	500	700	300	400	1,900	200	900	14,600
Audio-Visual Media	1,800	800	1,600				900					5,100
Command & Control												–
Communications	3,000	1,400										4,400
Computer Operations	900	700	100	*	400	1,400	9,500	*		200		13,200
Databank/Database	*	200		500								700
Extension/Outreach							1,200					1,200
Financial Analysis	1,800	1,000	7,900		*	100	200				1,400	12,400
In-Company Training			300			300		5,900			500	7,000
Information Analysis	1,000	1,900	100	*			*					3,000
Library/Archives	26,300	10,300		22,600	400		13,800	900	1,100		2,500	77,900
Management Info. System	9,600	3,600	5,100	800	2,900		1,400	*			1,000	24,400
Medical Records	100	200	*	*								300
Public Information/PR	400	1,900	400	*						600		3,300
Research/Analysis/Plng.	600	900	14,500	800	1,300	100	200		300		300	19,000
School/Academic Dept.	100	*	100				*	300	*	*	*	500
Systems Analysis/Prog.	4,800	2,000	2,200	100	8,200	3,700	6,500	100		100		27,700
Technical Information	400	6,100	11,900	1,200				*	*		100	19,700
Technical Reports Prepn.	200	900		*					100			1,200
Other	27,200	42,400	9,300	5,600	2,200	2,100	3,200	6,200	100		26,700	125,000
Unspecified	2,000	1,800	3,400	200	400	400	1,100	300	300			9,900
Total	83,800	78,800	59,700	32,400	16,300	8,800	38,300	14,100	3,800	1,100	33,400	370,500

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

Table 32. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR ORGANIZATIONAL SUBUNITS AND BY SIZE OF THEIR AGENCY: 1980

SUBUNIT	SIZE OF AGENCY									TOTAL
	50 or fewer	51 - 100	101 - 250	251 - 500	501 - 1,000	1,001-2,500	2,501-5,000	More than 5,000	Size unknown	
Abstracting/Indexing										–
Administrative Services		8,900	2,500	200	2,500	200	100	100	100	14,600
Audio-Visual Media	*	2,900	200	900					1,100	5,100
Command & Control										–
Communications	2,300		2,100							4,400
Computer Operations	200	2,500	2,100	1,300	1,800	4,300	200	100	700	13,200
Databank/Database	200				500			*		700
Extension/Outreach				1,200						1,200
Financial Analysis	1,700	500	9,700	100		200		100	100	12,400
In-Company Training	–		3,600		3,400					7,000
Information Analysis	100	2,900				*	*	*		3,000
Library/Archives	4,600	19,900	12,800	7,600	4,200	200	500	*	28,100	77,900
Management Info. System	4,600	13,300		4,000	600	1,400	200	100	200	24,400
Medical Records	300						*			300
Public Information/PR	1,100		100	2,000		*		100		3,300
Research/Analysis/Plng.	10,600	2,700	1,700		1,000	1,000	200	100	1,700	19,000
School/Academic Dept.				100				400		500
Systems Analysis/Prog.	800	6,300	200	3,200	4,600	900	300	5,500	5,900	27,700
Technical Information	4,600	4,200		10,400	*		200	200	100	19,700
Technical Reports Prepn.	–			800		200	*	100	100	1,200
Other	8,600	51,300	56,900	1,000	5,900	*	100	1,000	200	125,000
Unspecified	1,200	600	1,200			1,700	4,700		500	9,900
Total	40,900	116,000	93,100	32,800	24,500	10,100	6,500	7,800	38,800	370,500

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

than 250 employees) had a larger proportion of their information professionals working in library/archives subunits than did larger agencies (of more than 1,000 employees). The proportions were 25 percent and 4 percent, respectively.

The second largest subunit was systems analysis/programming, employing 27,700 information professionals, or 12 percent of the total. In contrast to the library/archives subunit, where the smaller the agency the greater the proportion of information professionals employed in the subunit, the opposite was true in the systems analysis/programming subunit. Here the proportions were reversed and it was found that 4 percent of the information professionals employed in small agencies were in the systems analysis/programming unit, while 34 percent of the information professionals in large agencies were in the same subunit.

The third largest subunit, employing 24,400 information professionals, was the management information systems subunit. Seven out of ten in this subunit were employed in agencies with 100 or fewer employees.

Workfields of Information Professionals

The areas in which information professionals work were divided into nine workfields (as described in Chapter Two) for the purposes of this study. Table 33 displays the data for the state and local government sector workfields, and shows the number of information professionals performing information functions in each workfield.

The largest employment area for information professionals in this sector was the education/training workfield. A total of 107,600 information professionals were employed in this workfield, representing nearly three in ten information professionals. The second largest workfield in state and local government was the library workfield where the number of information professionals employed was 69,900, representing 20 percent of the total in known workfields. The information services (non-library) workfield ranked third in this sector with respect to number of information professionals employed. Fifteen percent --53,600 persons--were reported as working in information services outside of libraries. The computer workfield employed 42,800 or about 12 percent of the total.

The breakdown of the number of information professionals by their workfield and their information function performed is given in Table 34. The largest proportion of information professionals in the education/training workfield was involved in data or information preparation on behalf of others (one in three). Twenty-five percent had no information function specified. There were 19,400 or 24 percent of those performing known information functions managing operations, services, or databases in this workfield.

The three most prominent information functions being performed by professionals in the library workfield were information management (33%), searching

Table 33. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR WORKFIELD: 1980

WORKFIELD	Number of Information Professionals	Proportion of Information Professionals (%)
Computer	42,800	12
Education/Training	107,600	29
Financial	21,100	6
Information Services	53,600	15
Library	69,900	19
Management Support	36,800	10
Research	20,600	5
Statistical	2,400	0.5
Technical Publications	2,300	0.5
Other	5,600	1.1
Unspecified	7,800	2
Total	370,500	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 34. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR WORKFIELD AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

WORKFIELD	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Computer	5,800	2,400	2,400	600	9,700	5,400	16,000	200		300	*	42,800
Education/Training	19,400	36,800	7,800	5,800		200	2,200	8,000	600		26,800	107,600
Financial	6,100	2,500	11,900		100	200	200				100	21,100
Information Services	14,200	14,900	14,000	2,500	1,300	2,100	2,900		100	500	1,100	53,600
Library	22,100	9,400	200	19,800	400		14,400		1,100		2,500	69,900
Management Support	12,700	7,300	5,000	2,600	400	600	800	3,600	1,200	300	2,300	36,800
Research	800	1,800	15,600	500	1,000	100	200		300		300	20,600
Statistical	*	1,200	900	100					200		*	2,400
Technical Publications	200	1,800	*	*		200			100			2,300
Other	1,100	600	600	500	300			2,300	200			5,600
Unspecified	1,400	100	1,300	*	3,100		1,600				300	7,800
Total	83,800	78,800	59,700	32,400	16,300	8,800	38,300	14,100	3,800	1,100	33,400	370,500

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 50 reported

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

Table 35. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNITS AND BY THEIR EDUCATION/ TRAINING WORKFIELD: 1980

SUBUNITS	EDUCATION/TRAINING WORKFIELD							TOTAL
	Academic Programs in Computer Science	Academic Programs in Information Science	Academic Programs in Library Science	Other Academic Programs	In-Company Training	Instructional Development	Audio-Visual Media	
Administrative Services					400	1,300		1,700
Audio-Visual Media						100	5,000	5,100
Communications							2,300	2,300
Financial Analysis						700		700
In-Company Training						3,400		3,400
Information Analysis						1,000		1,000
Library/Archives			900			2,300	4,400	7,600
Research/Analysis/Planning								-
School/Academic Dept.	100	300				100		500
Systems Analysis/Prog.								-
Technical Information								-
Other					3,800	81,300		85,100
Unspecified					200			200
Total	100	300	900		4,400	90,200	11,700	107,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Dept. = Department; Prog. = Programming

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977* for data or information on behalf of others (29%), and operational information functions including supervising and controlling data input to information systems (21%). The information professionals involved in the information services (non-library) workfield were distributed over the full range of functions, with the exception of education/training. Over eight in every ten information professionals were performing three functions in almost equal numbers: data preparation on behalf of others (29%), information management (27%), and data and information analysis on behalf of others (27%). Each of these functions employed between 14,000 and 15,000 information professionals.

The largest group in the computer workfield was primarily involved with non-managerial operations functions; these totalled 16,000 or about 38 percent of those in the workfield. Systems analysis employed 23 percent, while management functions accounted for another 13 percent.

The breakdown of the numbers of information professionals employed in agency subunits by workfield is shown in Tables 35 through 39.

A total of 85,100, about eight in ten, information professionals in the education/training workfield in state and local government agencies were not attached to one of the organizational subunits identified for this survey. Their work activity was primarily instructional development (96%), with the remaining four percent involved in in-company training, as shown in Table 35.

The largest subunit in the education/training workfield was library/archives. The 7,600 information professionals was a relatively small number (7%) when compared with the 107,600 total in the workfield. Nearly six in ten of the library/archives professionals were working with audio-visual media. Three in ten were involved in instructional development, while the last one in ten was training workers in library science. The 5,100 information professionals in the audio-visual media subunit were working mainly with audio-visual media; the remaining two percent were in instructional development.

A total of 69,900 information professionals was employed in the library workfield of the state and local government sector. All but 200, or a total of 68,000 of those in identified subunits, were employed in library/archives subunits. Their primary work activities were: management of information (43%), subject specialty (32%), and technical services (20%). The remaining three percent not in the library/archives subunits were scattered in small numbers in a few other subunits or in unspecified subunits as shown in Table 36.

The information services (non-library) workfield was distributed broadly over a number of subunits, as shown in Table 37. The largest single subunit employing information professionals in this workfield was the technical information subunit. All but thirty of the 19,300 professionals were in a work activity involving technical information; the thirty were engaged in management functions. As in other workfields, there was a large number of information professionals in the information services (non-library) workfield not identified with any of the subunits listed. Of the 17,600 professionals not identified with a subunit, nearly six

Table 36. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNIT AND BY THEIR LIBRARY WORKFIELD: 1980

SUBUNIT	LIBRARY WORKFIELD							TOTAL
	Library management	Archives management	Bibliography	Library systems automation	Reference and searching	Subject specialty	Technical services	
Abstracting/Indexing								
Administrative Services								
Audio-Visual Media								
Communications								
Computer Operations								
Databank/Database								
Information Analysis					100			100
Library/Archives	29,400	100			3,100	21,800	13,600	68,000
Management Info. System						100		100
Medical Records								
Public Information/PR					*			*
Research/Analysis/Planning		*						*
School/Academic Dept.								
Systems Analysis/Prog.								
Technical Information								
Technical Reports Prepn.								
Other	*				100	200	900	1,200
Unspecified						100	400	500
Total	29,400	100			3,300	22,200	14,900	69,900

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: **State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.***

Table 37. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNITS AND BY THEIR INFORMATION SERVICES WORKFIELD: 1980

SUBUNITS	INFORMATION SERVICES WORKFIELD							TOTAL
	Managing information services/	Marketing information services/	Educational information	Government information	Health/Legal/ Welfare information	Public & Consumer information	Scientific & Technical information	
Administrative Services	*							*
Audio-Visual Media								
Communications						700		700
Computer Operations	0						300	300
Databank/Database	*							*
Extension/Outreach	1,200							1,200
Financial Analysis							700	700
Information Analysis	0		*			*		*
Library/Archives								
Management Info. System	8,900		*		*			8,900
Medical Records					*			*
Public Information/PR	0		1,300			1,100		2,400
Research/Analysis/Planning								
Systems Analysis/Prog.	100						*	100
Technical Information	*						19,300	19,300
Technical Reports Prepn.								
Other	10,200				300	300	6,800	17,600
Unspecified	700				400	1,300		2,400
Total	21,100		1,300		700	3,400	27,100	53,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Prog. = Programming; Prepn. = Preparation

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees as reported by Bureau of Census *Governments Tape 1977.*

in ten were in management, with the majority of the remaining 6,800 in technical information. The other notable subunit employing information professionals was the management information systems subunit, where nearly all of the 8,900 information professionals reported were managing information services.

Approximately nine out of ten of the 42,800 information professionals in specified subunits in the computer workfield were found in one of two subunits: systems analysis/programming (61%) and computer operations (30%). Within the systems analysis subunit, about one in four was engaged in systems analysis, one in four in programming/software development, and another one in four in data processing. In the computer operations subunit, two out of every three information professionals were in the computer operations work activity, and another 15 percent in programming and software development. (See Table 38.)

The work activities in the management support workfield were spread over a number of subunits, as shown in Table 39, yet one out of every three information professionals in this workfield was not employed in any of these subunits. The largest subunit in terms of information professionals employed was the administrative services subunit, with 8,700 or one in three of the total in known subunits. These professionals were primarily involved with management services and administrative information systems. The other subunit with a relatively large number of information professionals was management information systems. The 6,200 here represented 26 percent of the total for this workfield. They were divided almost equally between two work activities: management services/analysis, and administrative information systems.

Occupational Titles of Information Professionals

The information functions were crosstabulated with groups of occupational titles in each workfield. The results are presented in Tables 40 to 44. Such crosstabulation is useful in showing which information functions are performed by which occupational title holders. The relationship (or lack of relationship) between occupational titles and information functions performed can then be clearly seen. Tables in the following section are analyzed for these relationships in the major information workfields of state and local government agencies.

Occupational titles denoting instructional development comprised the majority of those in the education/training workfield in state and local governments, with 90,100 information professionals, or 84 percent of the total distributed in Table 40. They were primarily involved with data preparation on behalf of others (four in every ten), and information management (two in every ten). Three in every ten were performing an unspecified function. Titles denoting audio-visual media activities formed the next largest group, representing 11 percent of the total. Information professionals in this occupational title group were mainly managing information (about one in every two), searching for data

Table 38. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNITS AND BY THEIR COMPUTER WORKFIELD: 1980

SUBUNIT	COMPUTER WORKFIELD						TOTAL
	Management of DP/Computer Systems and Services	Computer Operations	Computer User Liaison	Data Operations	Programming/ Software Development	Systems Analysis/ Design	
Administrative Services	*			*	100		100
Communications							
Computer Operations	600	8,300	*	900	1,800	400	12,000
Databank/Database				500			500
Financial Analysis		*			100	100	200
Information Analysis							
Library/Archives							
Management Info. System			*		*	2,900	2,900
Medical Records							
Public Information/PR							
Research/Analysis/Planning							
School/Academic Dept.							
Systems Analysis/Prog.	2,500	600	100	6,500	6,500	8,600	24,700
Technical Information				100			100
Technical Reports Prepn.							
Other	*					*	*
Unspecified		*	400	1,100	700	100	2,300
Total	3,100	8,900	500	9,000	9,200	12,100	42,800

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees as reported by Bureau of Census *Governments Tape 1977.*

Table 39. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR AGENCY SUBUNITS AND BY THEIR MANAGEMENT SUPPORT WORKFIELD: 1980

SUBUNITS	MANAGEMENT SUPPORT WORKFIELD						TOTAL
	Management Analysis/ Services	Administrative Systems and Services	File and Records Management	Personnel Information Systems	Planning Information Systems	Marketing Information Systems	
Administrative Services	2,500	1,600	200	4,400		*	8,700
Audio-Visual Media							
Command & Control							
Communications			700				700
Computer Operations							
Databank/Database							
Financial Analysis	1,400	*	700				2,100
In-Company Training		3,600					3,600
Information Analysis	1,000						1,000
Library/Archives	1,700						1,700
Management Information System	3,300	3,000					6,300
Medical Records	*						*
Public Information/PR							
Research/Analysis/Planning					100		100
Systems Analysis/Programming		300					300
Technical Information				*			*
Technical Reports Preparation		100					100
Other	6,000	*	1,400	400	2,800	800	11,400
Unspecified	800		*				800
Total	16,700	8,600	3,000	4,800	2,900	800	36,800

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees as reported in Bureau of Census *Governments Tape 1977*.

Table 40. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR OCCUPATIONAL TITLE GROUP (EDUCATION/TRAINING WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Education/Training Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Academic Programs: Computer Science	100											100
Academic Programs: Information Science								300				300
Academic Programs: Library Science								900				900
Other Academic Programs												
In-Company Training								4,300				4,300
Instructional Development	13,900	36,000	6,300	2,700		300	1,200	2,400	600		26,800	90,200
Audio-Visual Media	5,400	800	1,500	3,100			1,000					11,800
Total	19,400	26,800	7,800	5,800		300	2,200	7,900	600		26,800	107,600

Source ***Occupational Survey of Information Professionals 1980*****, University of Pittsburgh in conjunction with King Research Incorporated**

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

or information on behalf of others (one in every four), and analyzing data or information for others (about one in every ten).

The library workfield in state and local government agencies had occupational titles in three major groups. The information management group with 29,400 professionals was the largest group and represented about four out of every ten information professionals in the workfield. Titles in this group denoted managing, supervising, or controlling an operational function. A second large group of titles centered on subject specialties. This group had 22,100 professionals and represented about one in every three of the total. Subject specialists performing known functions were primarily engaged in searching for data and information on behalf of others (77%). The remaining 23 percent were divided between two functions: preparing data or information on behalf of others, and managing information operations, services, or databases. (See Table 41).

The remaining group of occupational titles in the library workfield denoted technical services. The 14,700 information professionals in this group were primarily supervising and controlling data input to systems (two out of every three).

One out of every two of the 53,600 information professionals providing an information service was in a group of occupational titles that centered on scientific and technical information. They performed two principal information functions in nearly equal proportions: data preparation and data analysis on behalf of others. These two functions represented 85 percent of the 27,100 information professionals in technical information. (See Table 42.)

The 42,700 information professionals in the computer workfield of state and local governments are shown in Table 43. One in four of the information professionals in this workfield had a title grouped under systems analysis and was performing a systems analysis function. Titles grouped under programming/software development and computer operations each accounted for 21 percent of the total.

Data on the management support workfield is displayed in Table 44. The two primary groupings of occupational titles were management services/analysis, with 47 percent of the total of 36,800 information professionals, and administrative information, with 22 percent of the total. Nearly two out of every three information professionals performing known functions in the former group of titles were performing a management function. In the latter group, the majority was primarily divided between the education/training function and preparing data or information on behalf of others.

Table 41. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR OCCUPATIONAL TITLE GROUPS (LIBRARY WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Library Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Library Management	20,700	3,600			400		4,700					29,400
Archives Management	*	100		*			*					100
Bibliography												
Library Systems Automation												
Reference and Searching	*			3,400								3,400
Subject Specialty	1,400	2,800	200	15,100			100				2,500	22,100
Technical Services		2,800		1,300			9,700		1,100			14,900
Total	22,100	9,300	200	19,800	400		14,500		1,100		2,500	69,900

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

Table 42. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR OCCUPATIONAL TITLE GROUPS (INFORMATION SERVICES WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Information Services Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Managing Information Services/Systems	10,600	1,100	1,600	1,100	1,100	2,100	2,500		100		1,000	21,200
Marketing Information Services/Systems	0											
Educational Information	*	1,300					*					1,300
Government Information	0											
Health/Legal/Welfare Information	*	100	400		200							700
Public and Consumer Information	1,200	1,300	*	100			200			600		3,400
Scientific and Technical Information	2,400	11,100	11,900	1,400		*	200					27,000
Total	14,200	14,900	13,900	2,600	1,300	2,100	2,900		100	600	1,000	53,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

Table 43 NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR OCCUPATIONAL TITLE GROUPS (COMPUTER WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Computer Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management of DP/ Computer Systems and Services	2,500	*	*	*	200	200	200	0				3,100
Computer Operations	300	*	*	*	100	*	8,500	*				8,900
Computer User Liaison	300	0	200	0	0	0	*	0				500
Data Operations	2,500	400	2,100	500	600	1,200	1,400	100		400		9,200
Programming/Software Development	*	*	*	*	1,500	1.800	5,700					9,000
Systems Analysis/ Design	100	1,900	0	100	7,400	2,300	200	100				12,100
Total	5,700	2,300	2,300	600	9,800	5,500	16,000	200		400		42,800

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*

Table 44. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN STATE AND LOCAL GOVERNMENTS BY THEIR OCCUPATIONAL TITLE GROUPS (MANAGEMENT SUPPORT WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Management Support Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management Analysis/ Services	9,200	1,200	2,000	1,600			100	*		200	2,300	16,600
Administrative Services/ Systems	200	3,500	300	200	400	300		3,600			*	8,500
File and Records Management		1,400	700			200	800					3,100
Personnel Information Systems	1,100	800	1,500	200				*	1,200			4,800
Planning Information Systems	2,100	300	300	200	100							3,000
Marketing Information Systems	100	100	100	400					100			800
Total	12,700	7,300	4,900	2,600	500	500	900	3,600	1,300	200	2,300	36.800

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Note: State and Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported in Bureau of Census *Go vernments Tape 1977.*

Chapter Six

INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT

The Office of Personnel Management (OPM) maintains a Central Personnel Data File of Federal agencies and their components. There are about 1,700 units in this file, referred to as Submitting Offices (SOs).[1] A sample of 152 Federal government agencies was chosen from this universe (48 were chosen with certainty and 102 were chosen with probability proportionate to size). Of the 152 sampled agencies, 46 responded to the survey. The total number of information professionals estimated in the Federal government is 78,900 (excluding personnel and agencies mentioned in the footnote). This number represents about five percent of the total number of information professionals found in the entire universe of four sectors of employment, as defined.

Size of Agencies Employing Information Professionals

The number of information professionals employed in Federal agencies of different sizes is given in Table 45. The number of information professionals is spread over all sizes of Federal agencies. For example, there are nearly 16,000 information professionals in agencies with 51 to 100 employees, and 15,000 in agencies with more than 5,000 employees. This comes to 25 percent and 24 percent, respectively, of those agencies of known size.

Table 46 shows the number of professionals performing information functions with the agencies surveyed grouped according to size. As expected, Federal agencies with 50 or fewer employees do not have many professionals performing the information functions identified for the survey; such agencies were, in fact, excluded from the sample. Sizeable numbers of information professionals are employed by agencies with more than 50 employees, while those agencies with more than 1,000 employees had professionals performing all of the first seven primary information functions. With few exceptions, however, the returns did not show the full range of information functions being performed until the size of the Federal agency reached 1,000 or more. Even in the bigger agencies, those with more than 1,000 employees, two functions–education/training of information

Table 45. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY SIZE OF AGENCY
1980

Number of Employees in Agency	Number of Information Professionals	Proportion of Information Professionals (%)
50 or fewer [a]	*	
51 - 100	15,800	20
101 - 250	6,100	8
251 - 500	3,700	5
501 - 1,000	6,100	8
1,001 - 2,500	11,600	15
2,501 - 5,000	5,700	8
More than 5,000	15,200	19
Unknown	14,700	17
Total:	78,900	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 100

[a] Some organizations reported having fewer than fifty employees, even though those so identified on the Central Personnel Data File had not been included in the sample.

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 46. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNITS: 1980

SUB-UNITS	Number of Information Professionals	Proportion of Information Professionals (%)
Abstracting & Indexing	400	0.5
Administrative Services	2,800	4
Audio-Visual Media	500	0.6
Command & Control	1,000	1
Communications	*	*
Computer Operations	22,800	29
Databank/Database	1,800	3
Extension/Outreach	22,800[a]	29[a]
Financial Analysis	500	0.6
In-Company Training	700	0.9
Information Analysis	1,000	1
Library/Archives	3,900	5
Management Information System	7,700	10
Medical Records	100	0.1
Public Information/Public Relations	1,100	1
Research/Analysis/Planning	3,600	4
School/Academic Department	*	*
Systems Analysis/Programming	16,200	20
Technical Information	1,700	3
Technical Reports Preparation	600	0.6
Other	5,500	6.6
Unspecified	200	0.1
Total:	78,900	100

*Fewer than 50 information professionals

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

[a] Includes 16,000 Extension agents from the Department of Agriculture known to exist but not chosen in the sample. (Reference:*1980 Budget Explanation Notes, Department of Agriculture, Science and Education Administration*, "Status of Program", page 199, para. 2.) The 16,000 figures is not added into the totals, in order to achieve consistency.

workers, and information research and development--were performed by a relatively small number of professionals.

As shown in Table 47, agencies with 500 or fewer employees indicated only three percent of their 25,600 information professionals as managing information operations, programs, services, or databases, while nearly 40 percent were involved in operational functions, excluding management. Agencies with more than 1,000 employees, on the other hand, reported that 14 percent of their 47,200 information professionals were in management, but only 19 percent were engaged in operational functions.

Organizational Subunits Where Information Professionals Work

Twenty types of subunits concerned with information activities were identified for the survey. The 78,900 Federal information professionals were distributed among the subunits as shown in Table 46. The largest subunits were computer operations, in which 22,800 information professionals work (32% of those in specified subunits), and a related subunit, systems analysis/programming, in which 16,200 information professionals work (22%). All of the remaining subunits represent fewer than 10,000 information professionals. Two subunits found only in the Federal sector are command and control units which have about 1,000 information professionals (excluding military and intelligence personnel) and extension/outreach units which have 22,800 information professionals. The number of information professionals found in library/archives subunits (3,900) is considered too low, as it is known that there are nearly 3,000 Federal libraries.

The information professionals in each of the subunits in the Federal sector were distributed across the primary information functions as shown in Table 48.

About one-half of the information management function in the Federal sector is performed in the subunits of computer operations and systems analysis/programming. Over 50 percent of those employed to prepare data or information on behalf of others were employed in extension/outreach units, in library/archives, and in management information systems. Over 60 percent of those analyzing data and information on behalf of others were in extension/outreach units, management information systems, and in research/analysis/planning subunits. The majority of those searching for data or information on behalf of others was in computer operations subunits. Ninety-five percent of those performing information systems analysis and information systems design were either in the computer operations or in the systems analysis/programming subunits. Over 80 percent of those in identified subunits in the operational function were in a computer operations subunit. The education and training of information workers was carried out mainly in "in-company" training units. Information research and development reported in the Federal sector was in research/analysis/planning subunits.

Table 47. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY SIZE OF THEIR AGENCY AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

NUMBER OF EMPLOYEES	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
50 or fewer[a]	*	*	*		*	*				*		*
51 - 100	200			1,300	2,900	2,100	9,300					15,800
101 - 250			1,300		1,800	1,600	600	600		200		6,100
251 - 500	400	800	2,100	200	*		200					3,700
501 - 1,000	100	3,000	3,000									6,100
1,001 - 2,500	2,500	1,500	3,500	200	2,100	700	1,000	100	0			11,600
2,501 - 5,000	500	800	1,000	100	600	*	1,600			1,100		5,700
More than 5,000	1,600	3,000	4,500	500	1,200	400	3,900	100				15,200
Unknown	1,300	2,400	2,700	2,000	2,300	1,400	1,900	300			400	14,700
Total	6,600	11,500	18,100	4,300	10,900	6,200	18,500	1,100	-	1,300	400	78,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

[a] Some organizations reported having fewer than fifty employees even though those so identified in the **U.S. Census Bureau** listings were not included in the sample

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House Staff, and Submitting Offices that reported fewer than fifty full-time employees.

Table 48. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNIT AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

SUBUNIT	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/information preparation on behalf of others	Data/information analysis on behalf of others	Searching for data/information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/training of information workers	Information research and development	Other information functions	Function not specified	
Abstracting/Indexing	*	400										400
Administrative Services	650	500	1,050	400		*		200				2,800
Audio-Visual Media	*	100	50	50			300					500
Command & Control	150	100	400	50			300					1,000
Communications	*	*										*
Computer Operations	2,200	1,000	300	2,300	1,800	1,300	13,300	200			400	22,800
Databank/Database	50	800	650	300								1,800
Extension/Outreach	300	2,900	2,900				700					6,800
Financial Analysis	100	*	200		100	100						500
In-Company Training								700				700
Information Analysis	100	300	400	200								1,000
Library/Archives	700	2,000	100	600	200	*	300	*				3,900
Management Info. System	600	1,300	5,400	*	100	100	200					7,700
Medical Records	50	50		*	*		*					100
Public Information/PR	100	400	400		*					200		1,100
Research/Analysis/Plng.	100	300	3,200	*					*	*		3,600
School/Academic Dept.												*
Systems Analysis/Prog.	1,000	200	700	100	8,700	4,700	800					16,200
Technical Information	100	500	700	200	*	*	200					1,700
Technical Reports Prepn.	*	100	400				100					600
Other	400	500	1,150	50	*	*	2,300			1,100		5,500
Unspecified		50	100	50								200
Total	6,600	11,500	18,100	4,300	10,900	6,200	18,500	1,100	-	1,300	400	78,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House Staff, and Submitting Offices that reported fewer than fifty full-time employees.

*Fewer than 25

The complete breakdown of information professionals employed in the subunits of the Federal sector by size of agency is found in Table 49. Independently-organized subunits dealing with computer operations, systems analysis/programming, and management information systems accounted for about two out of three of all the information professionals in identified subunits employed in the Federal sector. For those agencies with 500 or fewer employees, these three subunits accounted for over 70 percent of information professionals in those agencies. Smaller agencies with fewer than 500 employees reported information professionals in only fourteen of the total of twenty subunits in the survey list.

It is noted that a large portion (84%) of the Federal information professionals working in library/archives subunits are found in agencies with more than 5,000 employees. Most of these involve national libraries, which were chosen in the sample with certainty.

Workfields of Information Professionals

The nine workfields identified for this survey (by a method described in Chapter Two) represent the major areas in which information professionals are active. In the Federal sector the computer workfield employed 49 percent of the information professionals reported in identifiable workfields, as shown in Table 50. The next largest workfield, in terms of information professionals employed, was the management support workfield (17%), followed by the information services (non-library) workfield (16%). Other sizeable workfields were the research workfield and the library workfield, each with seven percent of the total.

In Table 51 the workfields of Federal information professionals are classified by the primary information function performed. The largest workfield was in the computer area (38,100 information professionals). Here it was found that 44 percent are working in operational information functions. Information systems analysis and design involves nearly as many information professionals (39%). Managing information accounts for eight percent of the information professionals performing specified functions in the computer workfield. Operational information functions such as data or information preparation, analysis, and searching on behalf of others together include about seven percent of these information professionals (see Table 52). The remaining workfields yield sparse results when subdivided by the primary information functions performed by information professionals.

Tables 53 to 56 show the distribution of information professionals in agency subunits in the other major workfields in the Federal sector.

Information professionals in the management support workfield numbered 13,600 and were found mainly in four organizational subunits in the Federal sector: management information systems (47%), systems analysis/programming (22%), administrative services (17%), and command and control (8%). The

Table 49. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNITS AND BY SIZE OF THEIR AGENCY: 1980

SUBUNIT	SIZE OF ESTABLISHMENT									TOTAL
	50 or fewer	51 - 100	101 - 250	251 - 500	501 - 1,000	1,001-2,500	2,501-5,000	More than 5,000	Size unknown	
Abstracting/Indexing							400			400
Administrative Services		200	700			100	*		1,800	2,800
Audio-Visual Media			400			*		100		500
Command & Control						100	500		400	1,000
Communications										*
Computer Operations		8,200		200		1,400	1,400	4,600	7,000	22,800
Databank/Database	*					300			1,500	1,800
Extension/Outreach					5,900	900				6,800
Financial Analysis						300	100	100		500
In-Company Training			600			100		*		700
Information Analysis						*	400		600	1,000
Library/Archives			100	100		200	100	3,300	100	3,900
Management Info. System	*			2,300		1,400	300	3,100	600	7,700
Medical Records						100		*		100
Public Information/PR	*		100			500	100	400		1,100
Research/Analysis/Plng.			100			800	400	1,700	600	3,600
School/Academic Dept.										*
Systems Analysis/Prog.	*	4,900	4,100	400		3,300	600	800	2,100	16,200
Technical Information				400	200	500	200	400		1,700
Technical Reports Prepn.				300		200		100		600
Other	*	2,300				1,400	1,200	600		5,500
Unspecified		200								200
Total	*	15,800	6,100	3,700	6,100	11,600	5,700	15,200	14,700	78,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House Staff, and Submitting Offices that reported fewer than fifty full-time employees.

Table 50 NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR WORKFIELD: 1980

WORKFIELD	Number of Information Professionals	Proportion of Information Professionals (%)
Computer	38,100	48
Education and Training	1,200	1
Financial	300	0.3
Information Services	12,400	15
Library	5,600	8
Management Support	13,600	18
Research	5,800	8
Statistical	100	0.1
Technical Publications	1,300	1
Other	200	0.4
Unspecified	300	0.3
Total:	78,900	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 51. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR WORKFIELD AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

WORKFIELD	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/information preparation on behalf of others	Data/information analysis on behalf of others	Searching for data/information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/training of information workers	Information research and development	Other information functions	Function not specified	
Computer	3,100	1,100	500	1,100	8,400	6,100	16,400	200		800	400	38,100
Education/Training	*	100					400	700		*		1,200
Financial	100	*	200									300
Information Services	800	4,800	5,300	600			700			200		12,400
Library	700	2,300	100	2,000	100	*	400					5,600
Management Support	1,500	2,000	6,600	400	2,400	100	400	200				13,600
Research	300	500	4,700	200		*	100		*			5,800
Statistical	*	*	100			*						100
Technical Publications	100	500	400							300		1,300
Other	*	100	100	*			*					200
Unspecified	*	100	100	*	*		100					300
Total	6,600	11,500	18,100	4,300	10,900	6,200	18,500	1,100	-	1,300	400	78,900

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 50 reported

Note: **Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.**

Table 52. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR COMPUTER WORKFIELD: 1980

SUBUNIT	COMPUTER WORKFIELD						TOTAL
	Management of DP/Computer Systems and Services	Computer Operations	Computer User Liaison	Data Operations	Programming/ Software Development	Systems Analysis/ Design	
Administrative Services							0
Communications							0
Computer Operations	1,500	9,800		*	4,900	5,200	21,400
Databank/Database							0
Financial Analysis	100	100					200
Information Analysis							0
Library/Archives	*	*	*	*	100	*	100
Management Info. System	*	*			*	100	100
Medical Records							0
Public Information/PR							0
Research/Analysis/Planning							0
School/Academic Dept.							0
Systems Analysis/Prog.	800	*			1,500	10,800	13,100
Technical Information	*			*		*	0
Technical Reports Prepn.							0
Other	*				*	3,200	3,200
Unspecified							0
Total	2,400	9,900	*	*	6,500	19,300	38,100

Source: *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

*Fewer than 50 reported

NOTE: Federal government does not include: military personnel and employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, U.S. Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty employees.

Table 53 NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNIT AND BY THEIR MANAGEMENT SUPPORT WORKFIELD: 1980

SUBUNITS	MANAGEMENT SUPPORT WORKFIELD						TOTAL
	Management Analysis/ Services	Administrative Systems and Services	File and Records Management	Personnel Information Systems	Planning Information Systems	Marketing Information Systems	
Administrative Services	100	300		1,800			2,200
Audio-Visual Media							
Command & Control	1,100						1,100
Communications							
Computer Operations							
Databank/Database							
Financial Analysis	*						*
In-Company Training				*			*
Information Analysis							
Library/Archives							
Management Information System	6,200			*	*		6,200
Medical Records							
Public Information/PR	*					*	*
Research/Analysis/Planning	800						800
Systems Analysis/Programming	600			2,300			2,900
Technical Information	*						*
Technical Reports Preparation							
Other	300		100	*			400
Unspecified							
Total	9,100	300	100	4,100	*	*	13,600

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

Note: **Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.**

primary activities of this workfield were management services/analysis, and personnel information systems. Together these activities were the main responsibility of 97 percent of the information professionals in management support.

Nearly 60 percent of the 12,400 information professionals in the information services (non-library) workfield were in extension/outreach subunits. Other subunits with relatively large numbers of information professionals were databank/database (14%) and technical information (12%). The remaining 16 percent were distributed over seven other subunits. The primary work activity of information professionals in the information services (non-library) workfield was managing information services (57%), while technical information (18%) and government information (13%) also had sizeable representation.

Information professionals engaged in research activities in the Federal sector were employed mainly in research/analysis/planning subunits and in management information systems subunits. These accounted for two out of three of the 5,800 information professionals in the research workfield. The principal activity of information professionals in this workfield was information analysis/research analysis, and research in general, which accounted for 93 percent of the total number in the workfield.

The library workfield in the Federal sector was not confined to libraries and archives. Forty-two percent of library work activity was carried out by the 5,600 information professionals in the subunits outside libraries and archives, mainly in computer operations where extensive searching and reference activity was reported. Searching and reference was the most frequently-reported library activity and also the one most likely to be found in non-library subunits of the Federal sector.

Occupational Titles of Information Professionals

Table 57 crosstabulates the information functions defined for the survey and the occupational title groups found in the computer workfield. Information professionals with primary responsibility for eight out of the nine information functions can be found in the cluster of occupational titles labeled computer operations. Seven of the nine functions are represented by titles grouped under systems analysis. Most of these are performing functions not ordinarily expected of persons with occupational titles related to computer operations and systems analysis; occupational titles in this workfield have little relationship to the primary information functions being performed.

The library workfield, as seen in Table 58, shows a closer relationship between occupational title groups and information functions performed. The professionals reported were either managing information operations. or carrying out the activity suggested by the occupational title. This supports the view that library

Table 54. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNIT AND BY THEIR INFORMATION SERVICES WORKFIELD: 1980

SUBUNITS	INFORMATION SERVICES WORKFIELD							TOTAL
	Managing information services/	Marketing information services/	Educational information	Government information	Health/Legal/ Welfare information	Public & Consumer information	Scientific & Technical information	
Administrative Services	*				*			*
Audio-Visual Media	*							*
Communications								
Computer Operations								
Databank/Database	*			1,600				1,600
Extension/Outreach	6,800							6,800
Financial Analysis								
Information Analysis								
Library/Archives	*						200	200
Management Info. System	*							*
Medical Records								
Public Information/PR	*				*	500	200	700
Research/Analysis/Planning		*	*	*			800	800
Systems Analysis/Prog.	100						*	100
Technical Information	*					*	1,400	1,400
Technical Reports Prepn.								
Other	100				200	400	100	800
Unspecified								
Total	7,000	*	*	1,600	200	900	2,700	12,400

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Prog. = Programming; Prepn. = Preparation

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

Table 55. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNIT AND BY THEIR RESEARCH WORKFIELD: 1980

SUBUNITS	RESEARCH WORKFIELD					TOTAL
	Management of Research	Research - General	Research - Institutional	Information/ Research Analysis	Program and Equipment Evaluation	
Administrative Services				600		600
Audio-Visual Media						
Communications						
Computer Operations						
Financial Analysis						
In-Company Training						
Information Analysis		200		800		1,000
Library/Archives	*	*			*	*
Management Information System				1,400		1,400
Public Information/PR		200				200
Research/Analysis/Planning	200	1,000	*	900		2,100
School/Academic Department						
Systems Analysis/Programming					*	*
Technical Information		*				*
Other		300			200	500
Unspecified						
Total	200	1,700		3,700	200	5,800

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

Table 56. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR AGENCY SUBUNITS AND BY THEIR LIBRARY WORKFIELD: 1980

SUBUNIT	LIBRARY WORKFIELD							TOTAL
	Library management	Archives management	Bibliography	Library systems automation	Reference and searching	Subject specialty	Technical services	
Abstracting/Indexing							400	400
Administrative Services								
Audio-Visual Media					100		*	100
Communications								
Computer Operations					1,300			1,300
Databank/Database	*					300		300
Information Analysis								
Library/Archives	300	*	100	100	600	200	1,900	3,200
Management Info. System								
Medical Records					*	*	100	100
Public Information/PR								
Research/Analysis/Planning					*		*	*
School/Academic Dept.								
Systems Analysis/Prog.			*					*
Technical Information	200		*		*	*		200
Technical Reports Prepn.								
Other					*	*		*
Unspecified								
Total	500	*	100	100	2,000	500	2,400	5,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

Table 57. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR OCCUPATIONAL TITLE GROUPS (COMPUTER WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Computer Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management of DP/ Computer Systems and Services	1,700	*	–	*	100	500	100					2,400
Computer Operations	600	1,000	400	1,000	1,200	1,300	3,800	200			400	9,900
Computer User Liaison	*											*
Data Operations	*						*					*
Programming/Software Development	400				200	300	5,600					6,500
Systems Analysis/ Design	400	100	100	100	6,900	4,000	6,900			800		19.300
Total	3,100	1,100	500	1,100	8,400	6,100	16,400	200		800	400	38,100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

*Fewer than 25

Table 58. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR OCCUPATIONAL TITLE GROUPS (LIBRARY WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Library Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Other operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Library Management	200	*	*	50			200					450
Archives Management		*										*
Bibliography	*	150				*						150
Library Systems Automation	*				50	*						50
Reference and Searching	100			1,900			*					2,000
Subject Specialty	100	300	100	*			*					500
Technical Services	300	1,950		*	*		200					2,450
Total	700	2,400	100	1,950	50	*	400					5,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

*Fewer than 25

Table 59. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR OCCUPATIONAL TITLE GROUP (INFORMATION SERVICES WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Information Services Work-field)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Managing Information Services/Systems	400	3,000	2,900				700					7,000
Marketing Information Services/Systems										*		*
Educational Information	*		*									*
Government Information	50	600	600	300								1,550
Health/Legal/Welfare Information	50	*	200									250
Public and Consumer Information	50	300	400							200		950
Scientific and Technical Information	150	900	1,300	200			100					2,650
Total	700	4,800	5,400	500			800			200		12,400

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

*Fewer than 25

Table 60. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR OCCUPATIONAL TITLE GROUPS (RESEARCH WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Research Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/information preparation on behalf of others	Data/information analysis on behalf of others	Searching for data/information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/training of information workers	Information research and development	Other information functions	Function not specified	
Management of Research	*		100				*					100
Research - General	*	200	1,450				50		50			1,750
Research - Institutional	50											50
Information Analysis/ Research Analysis	200	200	3,200	150								3,750
Program and Equipment Evaluation	*	150				*	*					150
Total	250	550	4,750	150			50		50			5,800

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

*Fewer than 25

Table 61. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN THE FEDERAL GOVERNMENT BY THEIR OCCUPATIONAL TITLE GROUPS (MANAGEMENT SUPPORT WORKFIELD) AND BY THEIR INFORMATION FUNCTION: 1980

OCCUPATIONAL TITLE GROUP (Management Support Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Other operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management Analysis/ Services	800	1,400	6,150	100	100	100	450					9,100
Administrative Services/ Systems	*	150	100	*								250
File and Records Management	100											100
Personnel Information Systems	600	400	300	350	2,300			150				4,100
Planning Information Systems			50									50
Marketing Information Systems			*									*
Total	1,500	1,950	6,600	450	2,400	100	450	150				13,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Note: Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

*Fewer than 25

activities are fairly well delineated and that occupational titles are reflective of what is actually being done on the job. This is in contrast with the computer workfield where it was difficult in many instances to see relationships between the information functions performed and the occupational titles used.

The primary information functions being performed in the information services (non-library) workfield were the preparation and analysis of data or information on behalf of others, usually done by information specialists. Additional information professionals were employed to manage these services and supervise the operations. The information services (non-library) workfield is shown by primary information function performed in Table 59.

The research workfield shown in Table 60 presented a picture quite similar to the information services (non-library) workfield. Again, the primary information functions performed were the preparation and analysis of data or information on behalf of others. Other information professionals managed these services and supervised or controlled the operations.

The management support workfield had representative numbers performing all the information functions except information research and development. The distribution is shown in Table 61.

NOTES AND REFERENCES : CHAPTER SIX

1 Excluded from this universe are military personnel, intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, and the White House staff. Also excluded from the survey were agencies with fewer than fifty employees.

Chapter Seven

INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES

A total of 270 colleges and universities was sampled and 103 institutions responded to the survey. The sample was chosen from the institutional listings in the *Education Directory, Colleges and Universities, 1977-1978,* compiled and published by the National Center for Education Statistics of the Office of Education (now the Department of Education). The reporting units are the institutional entities defined by the listings and the associated Federal Intra-Agency Committee on Education (FICE) codes. However, Federally-Funded Research and Development Centers were excluded.

A total of fifty-one institutions in the sample was chosen with certainty, some because of their size and others because they had departments of library or information science. A total of 980 institutions had fewer than fifty full-time employees and were excluded from the universe or sampling frame from which the sample was drawn. Table 62 shows the classification by size and number of full-time employees for these and the remaining 2,118 institutions.

The sample in the colleges and universities sector involved probability proportionate to size, where size was determined by reported number of full-time employees.

The estimated total number of information professionals in colleges and universities is 30,100, which is the smallest employment sector in the survey. [1] The distribution of these information professionals among the colleges and universities of different sizes, the subunits in which they work, the various workfields involved, and the primary information functions performed are discussed below.

Size of Institutions Employing Information Professionals

Tables 63 and 64 show the number of professionals performing information functions in colleges and universities when these are grouped according to the number of employees. Smaller institutions--those employing 100 or fewer--reported a limited range of functions, whereas institutions with 250 or more

Table 62. NUMBER OF INSTITUTIONS AND FULL-TIME EMPLOYEES IN CLASSES BY SIZE: 1977-1978

Classification by Size of Institution (No. of Employees)	Number of Institutions	Number of full-time employees
Fewer than 50	980	24,491
50 to 1,999	2,020	483,411
More than 1,999	98	186,091
Total	3,098	693,993

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

Table 63. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY SIZE OF THEIR INSTITUTION: 1980

Number of Employees in Institution	Number of Information Professionals	Proportion of Information Professionals (%)
50 or fewer	1,500	7
51 - 100	1,000	3
101 - 250	7,800	27
251 - 500	3,600	13
501 - 1,000	3,100	10
1,001 - 2,500	5,300	17
2,501 - 5,000	2,100	7
More than 5,000	4,300	13
Unknown	1,400	3
Total	30,100	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 64. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY SIZE OF THEIR INSTITUTION AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

NUMBER OF EMPLOYEES	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
50 or fewer[a]	700	700						100				1,500
51 - 100	500	200					300					1,000
101 - 250	2,500	400	*	400	200	100	800	3,400				7,800
251 - 500	1,200	600	100	300	100	200	600	400	*	*	100	3,600
501 - 1,000	700	300	300	200	400	100	1,000	100				3,100
1,001 - 2,500	800	800	400	400	500	300	1,100	800	100	100		5,300
2,501 - 5,000	300	100	*	100	400	200	500	200	100	*	200	2,100
More than 5,000	300	300	300	200	800	200	2,000	200	*			4,300
Unknown	300	200	300	100	*	*	300	200	*			1,400
Total	7,300	3,600	1,400	1,700	2,400	1,100	6,600	5,400	200	100	300	30,100

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

[a] Some organizations reported having fewer than fifty employees even though those so identified in the *Education Directory, Colleges and Universities, 1977-1978* listings were not included in the sample

Note: Colleges and Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

*Fewer than 25

employees were employing information professionals over the full range of functions. Those with 250 or fewer employees had a large proportion of their information professionals (36%) managing information operations, compared with large institutions, those over 1,000 employees, which had only 12 percent in a managerial capacity.

The proportion of information professionals performing research and development as their primary activity in colleges and universities was relatively small, about one percent. One explanation of this is that most of the information research and development is done by faculty members whose primary responsibility is teaching, which places them in the education/training function.

Organizational Subunits Where Information Professionals Work

Information professionals in colleges and universities are employed in a number of subunits, as shown in Table 65. One in three information professionals in a specified subunit was reported as being employed in a library/archives subunit. About one in five was reported to be in systems analysis/programming subunits, and one in six in a school/academic department. One in four was not identified with any of the subunits listed.

When independently-organized subunits of higher education institutions are examined in relation to their size in terms of employees, some basic facts are evident. The library/archives subunit is the single largest subunit of colleges and universities employing information professionals, with 8,200 or 37 percent of the total. This employment pattern was consistent over the entire range of sizes, from small colleges to large universities, as shown in Table 66.

No colleges or universities with 100 or fewer employees reported information professionals in the computer operations or systems analysis/programming subunits. These subunits were found in institutions of 250 or more employees and together they employed 26 percent of the information professionals in specified subunits. The third large subunit was the academic department/school, which reported 15 percent of the information professionals. These were mainly faculty members and research associates.

One finding of this survey was the diversity of the subunits employing information professionals in colleges and universities. On the other hand, colleges and universities are diversified communities and in many ways replicate society as a whole. The larger the institution, the more diversified its interests. It is not uncommon for large research universities to be involved in computing, databanks, public relations, libraries and archives, planning, management information systems, medical records, records in general, audio-visual media, financial analysis, administrative services, and so on.

In the colleges and universities sector, the largest group of information professionals in identified subunits performing managerial functions (37%) was found in library/archives. The largest single function in this subunit, as shown in Table 67, was the

Table 65. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS: 1980

SUBUNITS	Number of Information Professionals	Proportion of Information Professionals (%)
Abstracting and Indexing	100	0.3
Administrative Services	900	3
Audio-Visual Media	600	3
Computer Operations	2,200	7
Databank/Database	100	0.3
Financial Analysis	500	3
Information Analysis	200	0.7
Library/Archives	8,200	27
Management Information System	200	0.7
Medical Records	100	0.3
Public Information/Public Relations	300	0.7
Research/Analysis/Planning	800	3
School/Academic Department	3,400	10
Systems Analysis/Programming	4,200	13
Technical Information	100	0.3
Technical Reports Preparation	*	*
Other	500	1
Unspecified	7,700	27
Total	30,100	100

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

*Fewer than 50 professionals reported

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977.*

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

Table 66. **NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNIT AND BY SIZE OF THEIR INSTITUTION: 1980**

SUBUNIT	SIZE OF ESTABLISHMENT									TOTAL
	50 or fewer	51 - 100	101 - 250	251 - 500	501 - 1,000	1,001-2,500	2,501-5,000	More than 5,000	Size unknown	
Abstracting/Indexing				100						100
Administrative Services			400	*	100	300	*	100	*	900
Audio-Visual Media		200		100	100	200	*	*		600
Command & Control										
Communications										
Computer Operations			200	200	300	400	100	800	200	2,200
Databank/Database					*	100			*	100
Extension/Outreach										
Financial Analysis			100	200	100	100	*	0	*	500
In-Company Training						*				-
Information Analysis					100	100			*	200
Library/Archives		800	800	1,100	1,400	1,800	700	1,300	300	8,200
Management Info. System				*	100	100	*	*	*	200
Medical Records						*	*	100		100
Public Information/PR			100	100	*	*	*		100	300
Research/Analysis/Plng.			*	200	100	100	100	100	200	800
School/Academic Dept.	100		1,200	300	200	1,000	200	200	200	3,400
Systems Analysis/Prog.			200	800	600	900	400	1,100	200	4,200
Technical Information				100		*			*	100
Technical Reports Prepn.								*	*	*
Other				100	*	100	100	*	200	500
Unspecified	1,400		4,800	300		100	500	600		7,700
Total	1,500	1,000	7,800	3,600	3,100	5,300	2,100	4,300	1,400	30,100

Source: *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

*Fewer than 25

TABLE 7. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNIT AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

SUBUNIT	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Other operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Abstracting/Indexing	*	100					*					100
Administrative Services	200	100	100	*	200	100	200		*	*		900
Audio-Visual Media	400	100					100	*				600
Command & Control												
Communications												
Computer Operations	500	100	100	*	200	100	1,200		*	*		2,200
Databank/Database	*		*	*		*	100					100
Extension/Outreach												
Financial Analysis	400	100	*	*	*	*						500
In-Company Training								*				–
Information Analysis	*	*	200	*			*					200
Library/Archives	1,700	1,400	200	1,200	*	*	3,600	100	*			8,200
Management Info. System	*	*	100	*	100	*						200
Medical Records		*				100						100
Public Information/PR	100	200								*		300
Research/Analysis/Plng.	200	100	300	100	*	*	*	*	100			800
School/Academic Dept.	400	200	100	*	*	100	*	2,500	100	*		3,400
Systems Analysis/Prog.	700	200	100	100	1,400	600	1,000		*	100	*	4,200
Technical Information	*		*		100					*		100
Technical Reports Prepn.	*	*	*									*
Other	200	100	200	*	*	*	*	*	*			500
Unspecified	2,500	900	*	300	400	100	400	2,800	*		300	7,700
Total	7,300	3,600	1,400	1,700	2,400	1,100	6,600	5,400	200	100	300	30,100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Plng. = Planning; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

*Fewer than 25

operational function; the 3,600 information professionals engaged in this function represented about four in ten of the total reported in the library/archives subunits of colleges and universities, and 16 percent of all information professionals for this sector. The library/archives subunit of colleges and universities, in addition to employing 37 percent of those managing information activities also employed 54 percent of those preparing data or information on behalf of others, and 86 percent of those searching for data or information on behalf of others.

Professionals whose primary responsibility was information systems analysis were found mostly in the systems analysis/programming subunit (70%). Those whose primary responsibility was education and training of information workers were mainly in the academic departments or schools of the colleges and universities. Information research and development was conducted as a primary activity by information professionals who were either in an academic department or in a research/analysis/planning subunit.

Workfields of Information Professionals

The areas in which information professionals work were organized into nine separate workfields for this study (by a method described in Chapter Two). Tables 68 and 69 show the workfields for colleges and universities and the number of professionals performing information functions in each workfield. The predominant environment for information professionals in this sector was the library workfield. It accounted for one-third of the 30,100 information professionals estimated for the sector as a whole. Within this workfield, 39 percent were performing operational information functions, 22 percent were managing operations and programs, and 20 percent were preparing data or information on behalf of others.

One-fourth of the information professionals in colleges and universities were in the education/training workfield. Seventy percent of these were educating information workers; another 20 percent were managing information operations and programs. The computer workfield was the third largest employment area in colleges and universities. The 7,500 professionals employed in this area were primarily responsible for control and supervision of operational functions (32%)), systems analysis (30%), and managing information operations, programs, or services (16%).

Tables 70 to 75 examine more closely the work activities within the workfields. Thirty-three percent of those reported in the colleges and universities sector were in the library workfield. Table 70 shows that 43 percent were in library management, 27 percent in technical services, and 15 percent were searching and doing reference work on behalf of others. The work activities in the library workfield of this sector were dominated by information management (45%), followed by technical services (30%), searching and reference (19%), and subject specialty (12%).

Table 68. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR WORKFIELD: 1980

WORKFIELD	Number of Information Professionals	Proportion of Information Professionals (%)
Computer	7,500	23
Education/Training	7,600	27
Financial	1,300	3
Information Services	700	2
Library	9,800	33
Management Support	1,400	3
Research	1,500	7
Statistical	50	2
Technical Publications	150	0.3
Other	100	0.3
Unspecified		
Total	30,100	100

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

NOTES

(1) Industry does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the US banking industry.

(2) State & Local Government does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by Bureau of Census *Governments Tape 1977*.

(3) Federal Government does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

(4) Colleges & Universities does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

Table 69. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR WORKFIELD AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

WORKFIELD	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Computer	1,200	300	250	100	2,200	1,000	2,350	*	*	100		7,500
Education/Training	1,500	300	*	*	*	*	300	5,300	100	*	100	7,600
Financial	1,000	200	100	*	*	*	*					1,300
Information Services	400	200	*	100	*	*	*		*	*		700
Library	2,200	2,000	200	1,400	100	*	3,800	100				9,800
Management Support	600	300	300	*	100	100	*			*		1,400
Research	400	100	500	100	*	*	100		100	*	200	1,500
Statistical	*		50	*			*					50
Technical Publications	*	100	*				50					150
Other		100					*		*			100
Unspecified												
Total	7,300	3,600	1,400	1,700	2,400	1,100	6,600	5,400	200	100	300	30,100

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

* Fewer than 25 reported

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

Table 70. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR LIBRARY WORKFIELD: 1980

SUBUNIT	LIBRARY WORKFIELD							TOTAL
	Library management	Archives management	Bibliography	Library systems automation	Reference and searching	Subject specialty	Technical services	
Abstracting/Indexing	*				*		*	*
Administrative Services					100			100
Audio-Visual Media								
Communications								
Computer Operations	400							400
Databank/Database					*			*
Information Analysis						*		*
Library/Archives	3,500	100	100	*	1,200	1,000	2,200	8,100
Management Info. System								
Medical Records								
Public Information/PR								
Research/Analysis/Planning						*		*
School/Academic Dept.						*		*
Systems Analysis/Prog.	*				*			*
Technical Information								
Technical Reports Prepn.								
Other						*		*
Unspecified	500	*			300	*	400	1,200
Total	4,400	100	100	*	1,600	1,000	2,600	9,800

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

*Fewer than 25

The school/academic department was the primary employment subunit of the 7,600 information professionals in the education workfield in colleges and universities (see Table 71). Within this subunit, instructional development was the principal work activity (41%), followed by instruction in Computer Science (19%), in Library Science (16%), and in Information Science (13%). Audio-visual media was the next largest subunit in the education workfield in terms of numbers employed, where all the information professionals reported were in two work activities: audio-visual media (80%), and instructional development (20%).

The primary subunit of employment in the computer workfield, shown in Table 72, was the systems analysis/programming subunit, which employed 59 percent of the 6,750 information professionals in specified subunits. Of these, 45 percent were involved primarily with systems analysis, 34 percent with programming and software development, and 16 percent with data processing and computer services management.

The second-largest subunit in the computer workfield was computer operations, with 26 percent of the information professionals. Sixty-one percent of the professionals in this subunit were involved with computer operations activities. Other work activities included programming and software development (17%), and systems analysis (8%). The remaining information professionals in the computer workfield were scattered over the various subunits in Table 72.

Over one-half of the 1,500 information professionals in specified subunits in the research workfield were employed in research/analysis/planning subunits. Their primary work activity was institutional research (50%), followed by management of research (21%), and research in general (18%). The remaining information professionals in the research workfield were found in the other subunits shown in Table 73.

The only subunit in the management support workfield with more than a handful of information professionals was administrative services, which employed 70 percent of those identified with a subunit. Nearly 70 percent of the information professionals in this workfield were not allocated to one of the subunits shown in Table 74. Those in administrative services were primarily in personnel and file and records management.

As in the management support workfield, one-half of the information professionals in the financial workfield were not classified by subunit. Of those that were so classified, 85 percent were in financial analysis units where their primary activities were financial management (73%), and accountancy (18%). (See Table 75.)

Occupational Titles of Information Professionals

The occupational titles for each workfield were clustered into groups and crosstabulated with the information functions performed by title holders. The results are shown in Tables 76 through 78. Such a crosstabulation shows which

Table 71. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR EDUCATION/TRAINING WORKFIELD: 1980

SUBUNITS	EDUCATION/TRAINING WORKFIELD							TOTAL
	Academic Programs in Computer Science	Academic Programs in Information Science	Academic Programs in Library Science	Other Academic Programs	In-Company Training	Instructional Development	Audio-Visual Media	
Administrative Services								
Audio-Visual Media						100	400	500
Communications								
Financial Analysis								
In-Company Training					*			*
Information Analysis								
Library/Archives			*					*
Research/Analysis/Planning				*		50		50
School/Academic Dept.	600	400	500	400		1,300	*	3,200
Systems Analysis/Prog.	100	*						100
Technical Information						50		50
Other	*							*
Unspecified				2,900	100	400	300	3,700
Total	700	400	500	3,300	100	1,900	700	7,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Dept. = Department; Prog. = Programming

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

*Fewer than 25

Table 72. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR COMPUTER WORKFIELD: 1980

SUBUNIT	COMPUTER WORKFIELD						TOTAL
	Management of DP/Computer Systems and Services	Computer Operations	Computer User Liaison	Data Operations	Programming/ Software Development	Systems Analysis/ Design	
Administrative Services		*		*	250	250	500
Communications							
Computer Operations	100	1,100	50	100	300	150	1,800
Databank/Database				100	*		100
Financial Analysis							
Information Analysis				*		*	*
Library/Archives				*	100	*	100
Management Info. System	100				*	*	100
Medical Records					50		50
Public Information/PR							
Research/Analysis/Planning					*	*	*
School/Academic Dept.	*		*	*	50	50	100
Systems Analysis/Prog.	600	100	*	100	1,400	1,800	4,000
Technical Information						*	*
Technical Reports Prepn.							
Other				*	*	50	50
Unspecified	100	100			250	250	700
Total	900	1,300	50	300	2,400	2,550	7,500

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviations: Info. = Information; PR = Public Relations; Dept. = Department; Prog. = Programming; Prepn. = Preparation

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

*Fewer than 25

Table 73. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR RESEARCH WORKFIELD: 1980

SUBUNITS	RESEARCH WORKFIELD					TOTAL
	Management of Research	Research - General	Research - Institutional	Information/ Research Analysis	Program and Equipment Evaluation	
Administrative Services	50		*	*		50
Audio-Visual Media					*	*
Communications						
Computer Operations			*			*
Financial Analysis						
In-Company Training						
Information Analysis			*	150		150
Library/Archives						
Management Information System				*		*
Public Information/PR	*	*				*
Research/Analysis/Planning	150	100	350	100		700
School/Academic Department	*	100		*		100
Systems Analysis/Programming			50	*		50
Technical Information						
Other	*					*
Unspecified	50	300	100	*		450
Total	250	500	500	250	*	1,500

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

*Fewer than 25

Table 74. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR MANAGEMENT SUPPORT WORKFIELD: 1980

SUBUNITS	MANAGEMENT SUPPORT WORKFIELD						TOTAL
	Management Analysis/ Services	Administrative Systems and Services	File and Records Management	Personnel Information Systems	Planning Information Systems	Marketing Information Systems	
Administrative Services	50	*	100	100			250
Audio-Visual Media					*		*
Command & Control							
Communications							
Computer Operations			*				*
Databank/Database							
Financial Analysis	*					*	*
In-Company Training							
Information Analysis					50		50
Library/Archives		*					*
Management Information System	*						*
Medical Records	*						*
Public Information/PR							
Research/Analysis/Planning					50		50
Systems Analysis/Programming		*	*				*
Technical Information							
Technical Reports Preparation							
Other	200	*	100	*	*		300
Unspecified	100	600	50	*	*		750
Total	350	600	250	100	100	*	1,400

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Abbreviation: PR = Public Relations

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

*Fewer than 25

Table 75. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR INSTITUTIONAL SUBUNITS AND BY THEIR FINANCIAL WORKFIELD: 1980

SUBUNITS	FINANCIAL WORKFIELD				TOTAL
	Financial Management	Financial Analysis	Accountancy	Budgetary Control	
Administrative Services	50	*			50
Financial Analysis	400	*	100	50	550
Management Information System	*		50		50
Research/Analysis/Planning			*		*
Systems Analysis/Programming	*				*
Other					
Unspecified	650		*	*	650
Total	1,100	*	150	50	1,300

Source: *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

*Fewer than 25

information functions are performed by which occupational title groups and is suggestive of the relationship (or lack of it) between the occupational title and the function actually being performed. Each of these relationships is analyzed below for the major workfields of colleges and universities.

Titles dealing with the management of libraries constituted the largest cluster (45%) of the occupational titles in the library workfield. Within this cluster, 43 percent were performing operational information functions which included supervising a library (or automated information system) and developing and implementing procedures for records entry to information systems. Another 42 percent were managing information operations, programs, or services. (See Table 76.)

The second-largest cluster of occupational titles (16%) was related to technical services. Over 50 percent were performing operational information functions and 30 percent were primarily engaged in preparing data or information on behalf of others. Reference and searching was the third-largest group of occupational titles, accounting for 17 percent of the library workfield in colleges and universities. The primary function here involved searching for data and information on behalf of others.

Computer Science, Information Science, and Library Science have long been held as the principal academic disciplines which provide theoretical support for the information field. This survey showed that one-half of the activity related to the education of information workers in colleges and universities was being carried out by faculty in academic programs other than these three. This suggests that elements of information science are being taught in a number of other disciplines in some uncoordinated way, or that the interdisciplinary nature of information science has been understated. It is also likely that some smaller colleges are teaching courses such as computer programming without having a Computer Science Department, or courses such as mechanized information retrieval without having an Information Science Department or a Library Science Department.

Table 77 shows the remaining two large groups of occupational titles for information professionals in the education/training workfield as being instructional development (24%) and audio-visual media (11%). Nearly 60 percent of those in instructional development were performing an education function, probably developing information curricula. The majority of information professionals in audio-visual media groups were performing a managerial function.

The primary clustering of occupational titles in the computer workfield of colleges and universities was in systems analysis/design, which included one in three of the information professionals reported. The largest group (58%), as shown in Table 78, was analyzing information, with another large group doing information systems design work. Information professionals in this occupational title group were performing the full range of information functions, unlike those in the library workfield where occupational titles tended to be more

Table 76. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR OCCUPATIONAL TITLE GROUPS (LIBRARY WORKFIELD) AND THEIR INFORMATION FUNCTION PERFORMED : 1980

OCCUPATIONAL TITLE GROUP (Library Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Other operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Library Management	1,850	250	50	300	100		1,900					4,450
Archives Management		50					*					50
Bibliography		100		*								100
Library Systems Automation					*	*						*
Reference and Searching	100	500	100	800			100	50				1,650
Subject Specialty	100	350	50	150			400					1,050
Technical Services	150	750	*	150			1,400	50				2,500
Total	2,200	2,000	200	1,400	100	*	3,800	100				9,800

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

*Fewer than 25

Table 77. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR OCCUPATIONAL TITLE GROUPS (EDUCATION/TRAINING WORKFIELD) AND BY THEIR INFORMATION FUNCTION PERFORMED: 1980

OCCUPATIONAL TITLE GROUP (Education/Training Workfield)	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Other operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Academic Programs: Computer Science	*				*			550	*		100	650
Academic Programs: Information Science	*							400	50			450
Academic Programs: Library Science	*			*	*	*		450	*	*		450
Other Academic Programs	500							2,800				3,300
In-Company Training							100	*				100
Instructional Development	500	200	*	*			*	1,050	50			1,800
Audio-Visual Media	500	100		*			200	50				850
Total	1,500	300	*	*	*	*	300	5,300	100		100	7,600

Source *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

*Fewer than 25

Table 78. NUMBER OF INFORMATION PROFESSIONALS EMPLOYED IN COLLEGES AND UNIVERSITIES BY THEIR OCCUPATIONAL TITLE GROUPS AND BY THEIR COMPUTER WORKFIELD: 1980

OCCUPATIONAL TITLE GROUP	INFORMATION FUNCTION											TOTAL
	Managing information operations, programs, services, or databases	Data/ information preparation on behalf of others	Data/ information analysis on behalf of others	Searching for data/ information on behalf of others	Information systems analysis	Information systems design	Other operational information functions	Education/ training of information workers	Information research and development	Other information functions	Function not specified	
Management of DP/ Computer Systems and Services	700	*	*		50	100	100	*	*			950
Computer Operations	300	100	*		*	*	900	*	*	*		1,300
Computer User Liaison	*	*	*			*	50	*				50
Data Operations	100	*	50	50		*	*			100		300
Programming/Software Development	*	200	150	50	700	400	900					2,400
Systems Analysis/ Design	100	*	50	*	1,400	500	400		*			2,500
Total	1,200	300	250	100	2,200	1,000	2,350			100		7,500

Source *Occupational Survey of Information Professionals 1980*, University of Pittsburgh in conjunction with King Research Incorporated

Note: Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978*, and Federally-Funded Research and Development Centers.

*Fewer than 25

closely related to specific functions. Those information professionals with titles in the computer operations group (17%) were performing operational activities as a primary function, but were also doing most of the information functions identified for the survey, with the exception of the searching function, even though these were being performed in a limited way.

NOTES AND REFERENCES : CHAPTER SEVEN

1 This number was considered to be quite low and attributable in part to inadequate internal distribution of the survey questionnaire in the larger institutions. While libraries and computer centers were almost always included, other subunits, e.g., administration, business, personnel, research accounting, etc., may not have been adequately covered by the survey in larger universities.

Chapter Eight
OCCUPATIONAL TITLES OF INFORMATION PROFESSIONALS

Analysis by Workfield

This chapter deals briefly with the occupational titles reported for information professionals. As indicated in Chapter Two, much of the emphasis of the survey was placed on what information professionals actually do, particularly with regard to their involvement with information. Four of the primary information functions used as a basis for data collection were: preparation of data and information on behalf of others, information analysis, searching for data and information for others, and operational information functions such as library acquisitions, software development for computer systems, maintaining medical records, and so on. All of these functions involve primary information handling or services. In addition, information professionals are also engaged in three other categories of functions: management of information operations, programs, or services; technical aspects of information handling such as information systems analysis, information systems design, and information research and development; and the education and training of information workers.

The nine primary information functions used for the survey do not necessarily correspond to traditional occupational titles of information professionals found in industry, government agencies, or education institutions , since these titles tend to reflect traditional professions. A study of the unique occupational titles reported in this survey shows that quite a number of professionals from other disciplines have been reported as performing information functions (as defined for the survey) most of the time. Examples include the titles *Engineer, Hydrologist, Economist, Meteorologist*, and others. This survey clearly shows that these persons exist and gives their approximate distribution among the primary information functions performed (what they do), the employment sectors in which they are found, (industry, government, or education), and the organizational subunits in which they are located. All these items were self reported by the employers of the information professionals.

What was lacking in the survey data as reported was a general grouping of the information professionals into categories reflecting the general purpose for which they are engaged in performing the information functions. An attempt was made to form such groups by analyzing the 1,493 unique occupational titles reported in the survey by the organizational subunits in which the title holders worked and the primary information functions performed. Nine such general groups, called Workfields, were derived from the survey responses, as shown in Table 79.

Table 79. TOTAL NUMBER OF INFORMATION PROFESSIONALS BY THEIR WORKFIELDS: 1980

WORKFIELD	Number of Information Professionals
Computer	683,000
Education/Training	131,900
Financial	69,000
Information Services	150,500
Library	159,800
Management Support	167,700
Research	124,800
Statistical	3,900
Technical Publications	39,000
Other	12,700
Unspecified	98,700
Total	1,641,000

Source. *Occupational Survey of Information Professionals 1980,* University of Pittsburgh in conjunction with King Research Incorporated

NOTE: Industry sector does not include: industrial establishments reported by Dun and Bradstreet as having fewer than fifty employees (full-time and part-time), many firms found in Standard Industrial Classifications deemed unlikely to employ information professionals, and portion of the U.S. banking industry.

State and Local Government sector does not include: higher education institutions, several functional areas, and agencies with fewer than fifty full-time equivalent employees reported by the Bureau of Census *Governments Tape 1977.*

Federal Government sector does not include: military personnel or employees of intelligence agencies, Tennessee Valley Authority, Federal Reserve Board, Judiciary Branch, United States Courts, Supreme Court, White House staff, and Submitting Offices that reported fewer than fifty full-time employees.

Colleges and Universities sector does not include: institutions with fewer than fifty full-time employees reported in the *Education Directory, Colleges and Universities, 1977-1978,* and Federally-Funded Research and Development Centers.

At the end of this chapter is a complete listing of the reported occupational titles grouped by the nine derived workfields, and by subgroups of occupational titles called occupational title groups. The list shows which unique titles were subsumed under each occupational title group, the sector(s) in which they were found, and the information function(s) performed as primary activity by the person(s) holding each title. No indication is given of the number of times a particular title was reported, but as each information professional was reported under only one primary function, the fact that a title was found in more than one sector or covered more than one function is an indication of multiple occurrence of that title. It should be noted that the 1,493 unique occupational titles in this list represent only those reported for the 1,193 establishments surveyed, and that while they are indicative of a minimum number of titles used for information professionals, many more titles would be expected in the total population of establishments.

There was great difficulty in deriving consistent workfields. Natural groupings seemed to concentrate into (1) ways in which information professionals handle information or data (e.g., with the aid of computers, through information services, through libraries, or by technical publications) and (2) the type of information activity which can also be considered as the purpose for which the information is ultimately used (e.g., financial, management support, research, and statistical). One other natural grouping--education and training of information workers--did not fit into either of the two categories above. The nine derived workfields, and their relationship to the sectors of employment and information functions performed, are discussed below.

The computer workfield (683,000 information professionals), which reflects how information and data are handled, is subdivided into the following occupational title groups: management of computer/DP systems and services; computer operations; computer user liaison services; data operations; programming/software development; and systems analysis/design. The occupational titles of information professionals vary substantially among the four sectors of employment for this workfield. The Federal government has fewer titles in this area than the other sectors, i.e., there are 22 unique occupational titles in the Federal government, compared to nearly 200 similar titles in industry. This discrepancy highlights the fact that there are nearly fifteen times as many information professionals in industry as in the Federal government, according to our survey results. There were some instances, but they were not predominant, in which persons with specific occupational titles were reported to be performing quite unrelated primary information functions. For example, persons with the title Computer Coordinator were reported as performing the management function, data preparation on behalf of others, and searching for data and information on behalf of others.

The education/training workfield (131,900 information professionals) was subdivided into the following occupational title groups: academic programs, computer science; academic programs, information science; academic programs, library science; other academic programs; in-company training; instructional development; and audio-visual media. The sectors employing information professionals in this workfield are essentially as one would expect and the overlap of occupational titles among sectors is almost non-existent. There appears to be little ambiguity among the first five occupational title groups, in which nearly all the information professionals were reported to be performing education and training functions in relation to information workers.On the other hand, persons with occupational titles in the instructional development occupational title group were reported to be performing all of the nine primary information functions, although rarely was an occupational title found with more than one function. The audio-visual media occupational title group (which, on reflection, might better have been grouped separately since it reflects how information is handled) included information professionals who mainly perform operational information functions, or who are managing information programs and services.

The financial workfield (69,100 information professionals) , which reflects the type of information handled by information professionals, is subdivided into the following occupational title groups: financial management; financial analysis; accountancy; and budget control. The occupational titles in this workfield were spread evenly across the four employment sectors, but the titles were rarely common among the sectors. Of those persons with titles reflecting the management of information in this workfield, most were either preparing or analyzing information on behalf of others.

The information services workfield (150,500 information professionals) was broken down into the following occupational title groups , which correspond to types of information handled as well as management of information services: management of information services/ systems; marketing of information services/ systems; educational information; government information; health/legal/welfare information; public and consumer information; scientific and technical information. There is little commonality of occupational titles among sectors of employment. The primary information functions performed among all occupational title groups varies across nearly all primary information functions performed, although those included under public and consumer information, and scientific and technical information, seem to concentrate more on preparation, analysis, and searching for information on behalf of others.

The library workfield (159,800 information professionals) is subdivided into the following occupational title groups: library management; archives management; bibliography; library systems automation: reference and searching; subject specialty; and technical services. There seems to be a greater overlap of occupational titles among those employed in different employment sectors for this workfield than for any of the other workfields. One outstanding exception is that of persons with occupational titles in the library systems automation occupational title group and found in the Federal government sector. (However, all of these occupational titles were identified from a single observation.) The information professionals in the library workfield are spread across all of the operational information functions, with a few persons performing systems analysis and systems design (mostly in the library systems automation and the technical services occupational title groups).

The management support workfield (167,600 information professionals) is subdivided into occupational title groups by either type of operation performed or type of information handled, as follows: management analysis/services;

administrative systems and services; file and records management; personnel information; planning information; marketing information. There is little or no overlap of occupational titles among employment sectors, except in the case of the titles Management Analyst and Director of Management Information Systems which are found in all four sectors. All of the primary information functions performed by information professionals are found in the occupational titles in this workfield.

The research workfield (124,700 information professionals), which gives an example of the general purpose for which information professionals handle information, includes the following occupational title groups: management of research; research--general; research--institutional; information/research analysis; and program and equipment evaluation. The spread of occupational titles among sectors is fairly even, except for titles in the research--institutional group which are found only in colleges and universities. Those performing information research and development were found mainly in this workfield, although that was not at all the predominant information function performed by persons in this area. An example of the apparent ambiguity of occupational titles is that Research Analysts were reported to be performing all of the primary information functions except the management, searching, and education/training functions.

The statistical workfield (3,900 information professionals) was subdivided by the following occupational title groups: management of statistical services; statistical/mathematical analysis; and statistical programming. Information professionals with titles in these groups were primarily performing preparation and analysis functions on behalf of others.

The technical publications workfield (39,000 information professionals) contained the following occupational title groups: document production; technical reports/documentation; technical writing/editing. Survey responses showed that most of the professionals in this workfield were managing information programs or services, or preparing data and information on behalf of others. They were spread over all sectors of employment.

An example of the ambiguity of occupational titles, when considered in relation to the information functions performed, is found in the primary information function "Searching for Data/Information On Behalf of Others". Persons who were reported to be performing this function as a primary activity were found in every workfield and in nearly every occupational title group. This function was clearly defined and relatively unambiguous, yet persons were reported for this function with such diverse occupational titles as *Computer Specialist, Consultant (Computer Operations Group), Production Systems Analyst, Instructional Librarian, Reference Librarian, Educational Consultant, Media Specialist, Auditor, Information Specialist, Project Director (Medical Records), Outreach Coordinator, Public Affairs Officer, Tax Technician, Hydrologist, Sensing Specialist, Archivist, Business Manager, Management Analyst, Personnel Management Specialist, Planning Analyst, Marketing Specialist, Coordinator (Research and Analysis), Engineer (Research and Development), Research Assistant and Reports Reference*

Specialist. It is noted in this connection that in the pre-test interviews (see Chapter Two for details), the personnel directors indicated that persons performing information functions such as searching on behalf of others were often given titles that reflect professional affiliations which command higher salaries than those paid to "information searchers". While there is no suggestion that these professionals should relinquish their original professional affiliation, there is a strong suggestion that the information profession could do much to help in the education, training, and professional activities of these workers insofar as the type of functions they are actually performing on the job are concerned.

Further research which is planned as a follow up to the occupational survey of information professionals will seek to establish profiles of individuals performing information functions (including individuals with occupational titles in other disciplines) in order to make detailed recommendations on how their education, training, job classifications, and professional activities can be enhanced. This present survey merely establishs the fact that information professionals can be identified across disciplinary boundaries, and gives their approximate distribution among the four sectors of employment surveyed, thus providing a population for further sampling in the research designed to gather and analyze individual profiles.

KEY TO THE LIST OF UNIQUE OCCUPATIONAL TITLES WHICH FOLLOWS

SECTORS	I	Industry
	S/L	State and Local Government
	F	Federal Government
	C/U	Colleges and Universities
FUNCTIONS	1	Managing information operations, programs, services, or databases
	2	Data/Information preparation on behalf of others
	3	Data/Information analysis on behalf of others
	4	Searching for data/information on behalf of others
	5	Information systems analysis
	6	Information systems design
	7	Operational information functions, excluding management
	8	Education/training of information workers
	9	Information research and development
	10	Other information functions (specified by respondent)

TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR *				FUNCTION *									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
COMPUTER WORKFIELD														
Management of Computer/DP Systems and Services OTG														
Acting Director, Computer Services				*	*									
Administrative Assistant, Computer Services Division		*			*									
Administrative Manager (Data Processing)	*				*									
Assistant Director, Computer Center				*	*									
Assistant Director, Computer Services				*	*									
Assistant Director, Systems and Communications		*			*									
Assistant Manager, Computer Center				*	*									
Assistant Vice-President, Computer Services				*	*									
Associate Director, Computer Center				*						*				
Chief of Data Systems		*			*									
Chief of Systems and Standards	*				*									
Commercial Supervisor	*				*									
Computer Programming Engineer		*			*									
Computer Systems Coordinator				*							*			
Computing Services Coordinator (Engineering School)				*	*									
Coordinator, Academic Computing				*								*		
Computing Services Manager	*				*									
Coordinator of Computer Services				*	*									
Coordinator, MIS Computerization		*			*									
Data Center Manager	*			*	*									
Data Processing Center Manager		*			*									
Data Processing Systems and Programming Manager		*			*									
Director, Academic Computer Applications				*	*									
Director, Academic Computing Service				*	*									
Director, ADP Center				*	*									
Director Computation Center				*	*									
Director, Computer Center				*	*									
Director of Computer Center and Academic Programming				*	*									
Director (Computer and Management Services)				*	*									
Director, Computer Research				*				*						
Director, Computer Resources				*	*									
Director, Computer Services				*	*									
Director, Computer Systems				*	*									
Director, Data Processing and Computer Center (Research Projects)				*	*									
Director of Data Systems				*	*									
Director, Systems and Communications		*			*									

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*Explanation of codes used is given on page preceding the commencement of this list

TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Director, University Computing Activity				*	*									
Division Staff Supervisor, Engineering/Networks Services	*				*									
Manager, Academic Computing				*								*		
Manager of Academic Computing and Project Control				*	*									
Manager, Computer Center				*	*									
Manager, Computer Services	*			*	*						*			
Manager, Computing	*				*									
Manager of Fiscal Services and Data Processing		*			*									
Office Manager (Computer Systems)	*				*									
Project Manager (Data Systems Group Computer Services)	*							*						
Section Manager, Data Processing	*				*									
Superintendent (Computer Section)	*				*									
Supervising Systems Specialist		*			*									
Supervisor/Computer Specialist			*		*					*				
Supervisor, Systems Development		*			*									
Systems Development Manager		*			*									
Transportation Engineering Administrator (Systems Development)		*			*									
Vice President, Computer Services	*			*	*									
Computer Operations OTG														
Administrator (Computer Operations)				*	*						*			
ADP Librarian		*							*					
Associate Director, Computer Operations				*		*								
Associate Director and Production Manager (Computer Operations)				*	*	*	*				*			
Associate Director, Productions (Computer)				*	*									
Associate Director, Support Services	*								*					
Chief of Computer Operations	*										*			
Chief Operator	*				*									
Computer Operations Analyst				*							*			
Computer Operations Manager	*			*	*									
Computer Operations Manager		*						*						
Computer Operations Project Manager	*				*									
Computer Operations Specialist	*								*					
Computer Operations Supervisor	*	*									*			
Computer Operations Supervisor		*			*									
Computer Operator	*	*		*	*	*	*		*		*			
Computer Specialist	*		*		*	*	*	*	*	*	*	*	*	

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Computer Operations OTG (continued)														
Coordinator (Technical Control Department)	*						*							
Data Processing Librarian	*										*			
Data Processing Systems Engineer		*								*				
Data Services Support	*				*									
Director, Computer Operations			*		*									
Director of Operations				*	*									
EDP Tape Librarian				*		*								
Input-Output Control Supervisor				*						*				
Key Punch Supervisor	*				*									
Lead Operator	*				*						*			
Manager, Computer Operations	*			*	*						*			
Manager, Real-Time Operations	*										*			
Operation Auditor (Computer)	*						*							
Operations Analyst	*	*					*		*					
Operations Manager (Computer)	*	*		*	*	*			*		*			
Operations Manager II				*	*									
Operations Scheduler/Supervisor		*			*									
Operations Supervisor (Computer)	*			*	*						*			
Operations Systems Analyst		*							*					
Operator	*					*	*		*		*			
Principal Computer Operator		*									*			
Production Controller (Computer)				*			*							
Production Control Supervisor (Computer)	*										*			
Program Coordinator (Computer Operations)		*			*						*			
Quality Controller, Computer Operations				*							*			
Remote Job Entry Terminal Operator		*									*			
Senior Computer Operator		*									*			
Senior Computer Programmer Operator	*				*									
Senior Operations Supervisor	*										*			
Shift Supervisor, Operations	*										*			
Supervisor, Central Systems	*										*			
Supervisor, Computer Operations			*		*						*			
Supervisor, Equipment Operation (Computer)		*			*									
Supervisor, Hybrid Computer Laboratory (Analog Facility)	*						*							
Supervisor, Technical Support	*										*			
Supervisory Operator	*										*			

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Supervisor, Tape Librarians	*										*			
Systems Engineer	*										*			
Systems Manager (Computer Operations)	*								*					
Systems Operator	*										*			
Tape Librarian	*	*				*					*			
Tape Librarian, Computer Operations		*				*								
Tape Library Supervisor (Computer Operations)	*										*			
Technical Assistant, Computer Operations				*							*			
Technical Specialist				*							*			
Vice President of Operations	*				*									
Computer User Liaison Services OTG														
Assistant Director, User Services				*	*									
Chief, User Applications Office (Library)			*		*									
Computer Coordinator	*			*	*	*		*						
Consultant (Computer Operations Unit)				*							*			
Coordinator, Computer Programs		*			*									
Customer Coordinator		*									*			
Customer Relations Quality Manager		*			*									
Customer Representative (Software Products)	*											*		
Data Processing Coordinator/Administrative Officer		*												*
Data Processing Liaison Officer	*							*						
Data Processing User Services Manager		*			*									
Director of User Services				*	*									
EDP Development Coordinator (Company liaison with MIS)	*								*					
EDP Services Coordinator	*										*			
Information Systems Assistant Director, Education		*			*									
Information Systems Director of Education		*			*									
Instructional Computing Consultant				*	*									
Office Chief, Staff Services (liaison with Data Processing)		*			*									
Programmer/Associate Director, User Services				*	*									
Programming Coordinator		*			*									
Programming Consultant (Faculty Computer Services)				*								*		
Sales Representative, Software	*											*		
Senior Customer Coordinator		*									*			
Systems Coordinator	*								*					
Systems and Procedures Liaison (Finance Department)	*				*									

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*Explanation of codes used is given on page preceding the commencement of this list

TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Computer User Liaison Services OTG (continued)														
User Consultant	*			*		*	*							
User Services Manager (Computer Operations)				*							*			
User Services Systems Analyst/Programmer				*		*								
Data Operations OTG														
Administrative Officer (Data Management)			*		*									
Assistant Administrator, EDP	*								*	*				
Assistant Data Control Specialist				*				*						
Assistant Data Processing Manager	*				*				*	*	*			
Assistant Staff Manager, Data Systems	*				*									
Associate Director and Manager (Center for Information Processing)				*	*									
Chief, ADP			*		*									
Chief, Data Processing Operations	*	*			*									
Communications and Data Services Officer				*	*									
Comptroller's Assistant (Computer Operations Unit)	*												*	
Computer Input Supervisor		*									*			
Control Center Manager (Computer)	*					*								
Control Services Supervisor	*										*			
Control Specialist (Data Processing)		*									*			
Control Supervisor	*					*								
Coordinator, Data Entry	*					*					*			
Coordinator of EDP		*			*									
Coordinator of Production (Systems Support)				*							*			
County Data Base Coordinator		*				*								
Data Analyst	*						*							
Data Base Administrator	*			*						*	*			
Data Base Analyst	*			*	*				*	*				
Database Communications Manager		*									*			
Data Base Coordinator				*		*								
Data Base Manager	*			*	*	*			*					
Database Operator	*							*			*			
Data Control Specialist				*				*						
Data Controller	*	*		*				*						*
Data Coordinator	*			*			*	*			*			*
Data Entry Supervisor		*		*	*						*			
Data Manager/Supervisor	*										*			
Data Processing Administrator				*	*									

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*Explanation of codes used is given on page preceding the commencement of this list

TITLE by OCCUPATIONAL TITLE GROUP (CTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Data Processing Analyst	*	*		*	*	*	*		*	*	*	*		
Data Processing Consultant	*								*					
Data Processing Coordinator		*				*								
Data Processing Director	*				*									
Data Processing and Payroll Manager	*										*			
Data Processing Manager	*	*		*	*	*				*				
Data Processing Operations Manager				*	*									
Data Processing Production Manager		*				*								
Data Processing Programmer		*								*	*			
Data Processing Programmer/Analyst		*							*	*				
Data Processing Quality Control Analyst		*					*							
Data Processing Supervisor	*			*	*				*	*	*			
Data Processing and Systems Planner				*					*					
Data Processing Systems Programmer		*								*				
Data Processor	*					*								
Data Systems Coordinator				*		*								
Director, Administrative Data Processing				*	*									
Director, DP Control Center	*				*									
Director (Databank)				*	*									
Director, Data Processing			*	*	*					*				
Director, Electronic Data Processing	*				*									
Director, EDP Systems Liaison	*								*	*				
District-Level Manager of Data Processing	*				*									
District Staff Manager, Data Systems	*				*									
Division Staff Manager, Database/Data Communications	*				*									
EDP Manager				*	*			*	*	*				
EDP Process Control and Technical Supervisor		*									*			
EDP Process Controller		*			*									
EDP Specialist	*												*	
File Control Supervisor				*							*			
File Control Support				*			*							
Group Supervisor, Data Control	*					*								
Information Specialist, Data Control	*						*							
Manager, Administrative Data Processing				*	*									
Manager, Computer Classification Development (Personnel)		*				*								
Manager, Data Control Center	*										*			
Manager, Database Services Branch		*				*								

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*Explanation of codes used is given on page preceding the commencement of this list

TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR *				FUNCTION *									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Data Operations OTG (continued)														
Manager, Data Center	*				*									
Manager, Data Control				*	*									
Manager, Data Entry				*						*				
Manager of Data Processing	*	*		*	*	*			*	*	*			
Manager, Data Production	*										*			
Manager, Data Services	*				*									
Manager, Data Systems				*						*				
Manager of Electronic Data Processing	*								*					
Manager, Technical Processing		*			*									
Operator (Data Processing)	*					*		*						
Project Leader (Data Processing)	*										*			
Project Manager, Data Processing		*							*					
Selection Manager (Information and Communications)	*										*			
Staff Editor, Data Control	*					*								
Staff Manager, Data Systems	*				*									
Supervisor I (Computer Center)				*							*			
Supervisor, Data Control	*				*									
Supervisor, Data Entry	*										*			
Supervisor, Data Processing	*					*								
Supervisor, Electronic Data Processing	*	*			*						*			
Vice President, Data Services	*				*									
Programming/Software Development OTG														
Advance Programmer	*								*					
Advance Programmer/Analyst		*								*				
Analyst/Programmer	*							*	*	*				
Analyst/Programmer Manager				*						*				
Analyst Specialist	*								*					
Applications Programmer	*	*	*			*	*		*		*			
Applications Programming Manager	*				*									
Assistant Director, Programming/Analysis				*	*									
Assistant Programmer				*						*				
Assistant Programmer Analyst	*									*				
Associate Director, Software				*							*			
Associate Programmer	*								*					

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*Explanation of codes used is given on page preceding the commencement of this list

TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR *				FUNCTION *									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Chief Programmer	*				*	*			*	*				
Chief of Programming and Systems Analysis		*			*									
Computer Programmer	*	*	*	*	*				*	*	*			
Computer Programmer Analyst I and II				*							*			
Computer Programmer Manager	*				*									
Computer Programmer, Technical			*								*			
Computer Services Programmer				*							*			
Computer Systems Programmer		*								*				
Consulting Programmer				*						*				
Data Processing Programmer	*	*			*	*	*				*			
Data Processing Systems Programmer	*	*				*					*			
Director of Programming and Systems Analysis	*				*									
Director of Systems and Programming				*	*									
EDP Senior Programmer				*					*	*				
Group Leader, Programmers	*									*				
Head Programmer	*	*			*									
Head, Systems Department	*				*									
Intermediate Programmer Analyst	*										*			
Lead Programmer	*			*	*					*				
Lead Programmer/Analyst	*								*		*			
Lead Software Analyst				*					*					
Lead Systems Programmer				*						*				
Lead Systems Programmer/Analyst	*								*					
Maintenance Programmer	*								*					
Management Analyst Programmer				*							*			
Manager (Computer Systems/Analysis Programming)	*								*					
Manager, Programmers	*				*									
Manager, Software				*	*									
Manager, Systems and Programming	*	*			*			*	*	*	*			
Principal Computer Programmer		*								*				
Principal Programmer				*						*				
Programmer	*	*	*	*	*	*	*		*	*	*			
Programmer/Analyst	*	*		*	*	*	*	*	*	*	*		*	
Programmer/Analyst, Economics				*					*					
Programmer/Analyst Supervisor		*				*								
Programmer/Computer Specialist			*							*				
Programmer, Electrical and Computing Engineering				*								*		

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR *				FUNCTION *									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Programming/Software Development OTG (continued)														
Programmer Supervisor	*								*					
Programmer/Systems Analyst	*								*	*				
Programming Manager, Data Processing	*				*									
Programming Supervisor	*			*	*				*		*			
Project Manager, Programming	*				*				*					
Research Programmer				*						*				
Senior Analyst	*						*							
Senior Analyst/Programmer	*			*					*	*				
Senior Applications Programmer	*										*			
Senior Computer Programmer/Analyst				*					*	*				
Senior Data Processing Systems Analyst	*						*		*					
Senior Programmer	*	*	*	*	*	*			*	*	*			
Senior Programming Technician	*								*					
Senior Scientific Programmer/Analyst				*					*	*				
Senior Software Analyst				*					*	*				
Senior Systems Programmer				*						*				
Software Engineer	*												*	
Software Programmer	*								*					
Software Programming Manager		*			*									
Software Specialist	*			*				*	*		*			
Software Support Specialist		*									*			
Software Systems Programmers	*										*			
Supervisor, Operating Systems	*				*									
Supervisor, Programming	*										*			
Supervisor, Systems Department	*				*									
Supervisor, Systems and Programming		*			*									
Supervisory Programmer				*					*					
Systems Analyst/Programmer				*					*		*			
Systems Programmer	*			*					*	*	*			
Systems and Programming Manager	*								*					
Systems Supervisor	*										*			
Vice President, Programming	*				*									
Vice President of Programming & Systems Development	*						*							

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*Explanation of codes used is given on page preceding the commencement of this list

TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Systems Analysis/Design OTG														
Advance Analyst		*			*	*								
Analyst	*	*							*	*				
Applied Computer Analyst				*					*					
Assistant Director, Systems and Communications		*								*				
Assistant Vice President, Systems Planning and Support		*								*				
Associate Administrative Analyst				*					*					
Bureau Chief, Systems Development and Programming		*			*									
Business Systems Analyst				*					*					
Chief, Planning and Technical Services		*			*									
Chief Research and Programming Analyst	*				*									
Chief, Systems and Programming		*			*									
Computer Analyst	*		*				*		*					
Computer Specialist (Systems Analysis)			*								*			
Computer System Analyst	*		*	*	*			*	*	*	*			
Computer Systems Administrator			*		*									
Computer Systems Coordinator				*				*	*					
Computer Systems Manager				*	*									
Computer Systems Officer			*						*					
Data Processing Systems Analyst	*	*							*	*				
Data Processing Systems Coordinator		*					*							
Data Systems Analyst				*					*					
Development Supervisor, Systems and Programming	*								*					
Director of Information Systems Planning	*									*				
Director of Software Systems				*	*									
Director of Systems Analysis				*	*									
Director, Systems and Communications		*								*				
Director, Systems Development				*	*				*					
Director, Systems and Programming				*	*									
Executive Assistant (Information Analysis)	*								*					
Exploration Systems Analyst	*							*						
Industrial Systems Engineer	*									*				
Information Systems Analyst	*	*	*						*	*				
Lead Systems Analyst	*								*					
Management Information Systems Analyst	*								*					
Manager of Executive Systems Development				*					*	*				
Manager, Systems Development	*									*				
Manager, Systems and Programming	*	*		*	*			*	*	*	*			

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Systems Analysis/Design OTG (continued)														
Manager, Systems Research and Development	*						*							
Principal ADP Systems Analyst				*						*				
Point-of-Sale Coordinator (Hardware and Software)	*								*					
Production Systems Analyst	*							*						
Project Coordinator				*	*					*				
Project Developer				*		*								
Project Manager (Systems Project Planner)	*			*					*	*	*			
Research Analyst		*							*	*			*	
Scanning Coordinator	*				*									
Senior ADP Systems Analyst				*						*				
Senior Analyst/Programmer, Administrative Data Processing	*			*					*	*				
Senior Computer Systems Analyst				*					*					
Senior Technical Staff Specialist	*								*					
Senior Methods Systems Analyst		*								*				
Senior Programmer/Analyst	*	*		*	*				*	*	*			
Senior Systems Analyst	*	*							*	*	*			
Senior Systems Analyst/Senior Programmer				*					*					
Senior Systems Designer	*								*	*				
Software Systems Specialist				*					*					
Supervisor, Applications Systems	*										*			
Supervisor, Distribution Systems	*										*			
Supervisor, Systems Development	*				*				*					
Systems Administrator			*		*				*					
Systems Analysis Coordinator		*							*					
Systems Analyst	*		*	*	*	*	*	*	*	*	*		*	
Systems Analyst/Manager		*			*									
Systems Analyst/Supervisor	*								*					
Systems Design Specialist		*								*				
Systems Designer	*								*	*				
Systems Expediter				*		*								
Systems Manager	*			*	*				*	*	*			
Systems Planner	*								*					
Systems and Procedures Analyst	*					*								
Systems Program Designer				*							*			
Systems Project Planner	*									*				
Systems Scientist	*									*			*	

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Systems Specialist	*								*					
Systems Supervisor	*	*		*	*			*			*			
Telecommunication Manager	*								*					
Transportation Engineer		*								*				
EDUCATION/TRAINING WORKFIELD														
Academic Programs, Computer Science, OTG														
Assistant Professor of Computer Science				*								*		
Assistant Professors (Programming, Mathematics Department)				*								*		
Associate Professor/Coordinator, Academic Computing				*								*		
Associate Professor, Computer Science				*								*		
Associate Professor and Director of Computer Applications Office				*								*		
Associate Professor, Mathematics and Computer Science				*								*		
Computer Engineer				*									*	
Director, Computer Science				*								*		
Director, Robotics				*	*									
Faculty Member, Applied Statistics and Computer Science				*								*		
Faculty Member, Computer Science				*								*		
Faculty Member, Data Processing				*								*		
Instructor, Data Processing				*								*		
Lecturer, Computer Science				*								*		
Professor of Computer Science				*								*		
Professor, Electrical and Computing Engineering				*								*		
Professor of Mathematics and Computer Science				*								*		
Research Computer Scientist/Research Associate				*									*	
Teacher of Computer Science (High School)		*										*		
Teacher of History of Computer Science		*										*		
Vice Chancellor, Computer Systems				*	*									
Academic Programs, Information Science, OTG														
Faculty Member, Information Science Department				*								*		
Faculty Member, Information Systems Department				*								*		

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Academic Programs, Library Science, OTG														
Administrator, School of Library and Information Studies				*	*									
Assistant Administrator, School of Library and Information Studies				*	*									
Assistant Librarian/Activities Instructor				*							*			
Assistant Professor, Library Science				*				*			*			
Associate Professor of Library Science				*							*	*		
Instructional Librarian				*				*						
Lecturer, School of Library and Information Science				*								*		
Librarian - Instruction				*				*						
Librarian/Instructor (High School)		*										*		
Professor of Library Science				*	*							*		
Other Academic Programs OTG														
Assistant Director, Multicultural Education	*				*									
Assistant Director, Social Science Training Laboratory				*	*									
Assistant Professor of Mathematics				*								*		
Associate Professor of Mathematics				*								*		
Faculty, School of Business and Administrative Science				*								*		
Dean of Students (Continuing Education)				*	*									
Department Chairperson				*	*									
Director, Academic Computer Applns., School of Management				*								*		
Director of Life-Long Learning				*								*		
Director, Multicultural Education	*				*									
Division Director, Multicultural Education	*				*									
Faculty, College of Liberal Arts and Science				*								*		
Faculty, Counselor Education				*								*		
Faculty, Research Courses				*								*		
Faculty, School of Engineering				*								*		
Faculty, School of Management				*								*		
Faculty, School of Natural Sciences				*								*		
Field Coordinator, Multicultural Education	*											*		
Instructor, Department of Medical Records Science)				*								*		
Placement Director, School of Library and Information Science				*										*
Professor, Building Studies				*								*		
Professor of Management and Marketing				*								*		
Professor of Mathematics				*								*		

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Professor (Medical Records Science)				*								*		
Program Specialist, Multicultural Education	*										*			
School/Community Relations Specialist (Multicultural Education)	*										*			
Trainer/Developer (Multicultural Education)	*											*		
Visiting Assistant Professor				*								*		
Visiting Associate Professor				*								*		
Vice President of Academic Affairs				*	*									
Vice President/Dean of College				*	*									
Vice President/Dean of Students				*	*									
In-Company Training OTG														
Associate Chief of Staff Education			*									*		
Base Education Trainer			*									*		
Career Counselor	*					*								
Director, Center for Management Development				*									*	
Director of Training	*											*		
District Fire Chief (Training)		*					*			*		*		
Educational Coordinator	*											*		
Educational Director	*											*		
Employee Development Assistant			*									*		
Employee Development Officer			*									*		
Employee Development Specialist			*									*		
Field Service Engineer	*											*		
Fire Lieutenant (Fire Safety Education)		*			*		*							
In-Service Coordinator	*											*		
In-Service Education Director and Instructor	*											*		
In-Service Training Director	*											*		
Manager, Management Development and Consultation		*										*		
Managing Editor, Trainees	*											*		
Staff Developer (Hospital)	*											*		
Superviser - Rate Clerk Training (Underwriting)	*											*		
Technical Trainer	*											*		
Training Administrator			*									*		
Training Consultant		*										*		
Training Coordinator (Personnel)				*								*		
Training Director	*				*							*		

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
In-Company Training OTG (continued)														
Training Officer (Civilian Force)	*		*									*		
Training Officer (Staff Development)		*										*		
Training Specialist (Personnel)	*											*		
Training Specialist (Sales and Underwriting)	*											*		
Training and Education Coordinator	*											*		
Training Manager	*				*							*		
Instructional Development OTG														
Assistant Director, Instruction Research				*	*									
Assistant Director, Learning Resource Center				*	*									
Associate Director, Instructional Services				*	*									
Associate, Instructional Improvement	*											*		
Consultant in Evaluation and Testing		*				*								
Coordinator of Curriculum		*			*									
Coordinator (Learning Resources Center)				*	*							*		
Coordinator, Long-Range Planning (Learning Resources)				*	*									
Curriculum Development Specialist	*							*						
Curriculum Director		*				*								
Curriculum Specialist	*										*			
Dean of Learning Resources				*	*									
Developer, Instructional Improvement	*							*						
Director, Center for Instructional Development				*									*	
Director, Computerised Learning				*			*							
Director of Curriculum (Research and Development)	*					*								
Director, Division of Learning Resources				*	*									
Director, Educational Communications				*		*								
Director of Educational Support Services				*	*									
Director of Instruction		*			*	*	*				*			
Director, Instructional Development and Evaluation				*	*									
Director, Instructional Improvement	*				*									
Director, Instructional Resources				*	*									
Director, Instructional Services				*	*									
Director of Learning Resource Center				*	*									
Director, Grants Planning (Learning Resources)				*	*									
Division Director, Instructional Improvement	*				*									
Editor, Instructional Improvement	*							*						

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Education Consultant (Instructional Services)		*			*	*		*						
Educational Consultation Services Assistant		*				*					*			
Educational Coordinator	*											*		
Education Curricular Services Manager/Consultant		*			*									
Educational Facility Accreditation Specialist		*					*							
Educational Instruction Services Manager		*			*									
Education Licensing and Certification Lead Evaluator		*					*							
Education Licensing and Certification Supervisor		*					*							
Education Program Planning Evaluation Specialist		*						*						
Education Program Planning Evaluation Supervisor		*			*									
Education Program Services Managing Consultant		*			*									
Education Program Services Representative (Fiscal Unit)		*			*									
Education Specialist				*			*							
Education Specialist (Consultant to Schools)		*				*								
Evaluation/Assessment Specialist, Multicultural Education	*					*								
Evaluation Specialist (Education)	*					*								
Examination Development Specialist		*					*							
Faculty, Educational Media Courses				*								*		
Faculty, Instructional Media				*								*		
Information Resource Specialist (Instruction)				*			*							
In-Service Instructors	*											*		
Instructional Computing Consultant				*					*					
Instruction Developer (Educational Services)	*					*								
Instructional Media Specialist	*											*		
Instructional Program Specialist		*			*	*								
Materials Analyst, Multicultural Education	*								*					
Professor (Office of Instructional Planning)				*			*							
Project Manager for Educational Information Networks				*		*								
Senior Associate, Instructional Improvement	*					*								
Senior Programmer (Instructional Applications)				*						*				
Specialist, Instructional Improvement	*					*								
Supervisor, Bureau of Teaching Materials		*			*									
University Administrators (Educational Development Center)				*		*								
Writer-Developer, Instructional Improvement	*					*								

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Audio-Visual Media OTG														
Assistant Director (Audio-Visual Department)				*	*									
Audio-Visual Administrator		*		*	*									
Audio-Visual Coordinator	*	*		*	*	*								
Audio-Visual Director	*	*				*					*			
Audio-Visual Engineer	*										*			
Audio-Visual Librarian			*	*		*								
Audio-Visual Production Officer			*		*									
Audio-Visual Production Specialist				*		*								
Audio-Visual Specialist	*	*	*		*						*			
Chairperson, Communications Media				*	*									
Chief, Audio-Visual Technical Services				*		*								
Chief, Graphics				*		*								
Chief of Media Production				*							*			
Chief Media Specialist				*	*									
Chief of Medical Illustration				*							*			
Communication Supervisor		*										*		
Coordinator, Educational Technology				*							*			
Coordinator, Instructional Media Services				*							*			
Coordinator, Media Resources				*		*								
Director, Audio-Visual Department				*	*									
Director, Audio-Visual Services				*	*						*			
Director, Biomedical Photography				*	*									
Director of Broadcasting (College of Fine and Applied Arts)				*							*			
Director of Educational Media				*	*									
Director, Illustration (Division of Learning Resources)				*	*									
Director, Instructional Media Services				*	*									
Director, Library and Audio-Visual Services	*			*					*					
Director, Media Center				*		*								
Director of Media Services				*	*									
Director of Micrographics	*				*									
Director, Slide Library				*							*			
Director, Television (Academic)				*	*									
Faculty Member, Communications Media				*								*		
Graphics/Audio-Visual Specialist				*	*									
Head of Audio-Visual and Micro Materials				*				*						

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Head of Processing Section (Sound Recording, Library Unit)			*		*									
Information Media Center Director		*			*									
Media Center Manager	*				*									
Media Librarian				*	*									
Media Manager	*			*	*									
Media Specialist	*	*		*	*	*		*			*			
Special Technician (Audio-Visual Services)				*							*			
Supervisor, Media Center		*			*									
Supervisor, Microform Publications Unit			*		*									
Telecommunications Network Coordinator	*				*									
Television Production Specialist (Library Unit)			*			*								
Vice President for Information/Micro Specialist	*										*			
FINANCIAL WORKFIELD														
Financial Management OTG														
Assistant Controller		*		*	*									
Assistant Secretary-Controller	*				*									
Assistant Treasurer (Financial Management)	*				*		*							
Assistant Vice President, Investment and Cost	*				*									
Business Manager		*		*	*									
Chief Comptroller			*		*									
Comptroller	*	*	*	*	*	*	*	*		*		*		
Comptroller, Business Services				*	*									
Comptroller, Fiscal				*	*									
Comptroller/Systems Analyst		*							*	*				
Controller	*	*		*	*	*			*					
Controller, Business Office				*	*									
Controller of Finance	*				*									
Controller/Supervisor	*										*			
Director of Business Affairs				*	*									
Director of Finance	*			*	*									
Director of Fiscal Applications				*	*									
Distribution Financing Manager	*				*									
Division Staff Supervisor, Payroll Systems	*				*									
Division Staff Supervisor, Property and Cost	*				*									

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Financial Management OTG (continued)														
Finance Officer		*								*				
Financial Advisor	*					*								
Financial Manager			*	*	*									
Financial Officer				*	*									
Fiscal Control Officer		*			*									
Fiscal Director				*	*									
Fiscal Manager				*	*									
Management and Financial Consultant		*					*							
Manager, Financial Information Systems				*	*									
Manager, Financial Systems	*						*							
Manager, Financial Systems Development	*				*									
Payroll Systems Manager (Management Information System)		*			*									
Supervisor, Accounting Systems	*				*									
Supervisor, Merchandising Systems	*				*									
Supervisor, Technical Systems	*				*									
Treasurer	*												*	
Vice Chancellor, Business Affairs				*	*									
Vice President for Business Affairs				*	*									
Vice President in Charge of Finance	*				*									
Vice President, Finance				*	*									
Vice President Treasurer	*				*									
Wage and Salary Specialist		*					*							
Financial Analysis OTG														
Assistant Manager, Financial Analysis	*						*							
Bank Examiner's Assistant		*					*							
Bank Examiner, Commissioned		*				*								
Bank Examiner (Finance Examinations Bureau)		*				*								
Bank Examiner, Senior Assistant		*					*							
Bureau Chief, Uniform Consumer Credit		*			*									
Certificate of Need Analyst		*					*							
Claims Specialist		*				*	*							
Consumer Credit Investigator		*				*								
Coordinator (Grants Office)				*		*								
Credit Union Examiner		*				*	*							
Financial Analyst	*	*	*		*	*	*							

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Fiscal Systems Analyst				*			*			*				
Grants Administrator		*				*								
Grants Coordinator		*				*								
Insurance Analyst		*					*							
Investment Analyst	*					*								
Management Analyst			*		*									
Management Analyst (Unemployment Insurance)		*					*							
Manager, Budgeting and Financial Analysis	*				*									
Manager, Employee Benefits		*					*							
Manager, Financial Analysis	*				*									
Manager, Photo Cost and Financial Analysis	*				*									
Manager, Reproduction Cost and Financial Analysis	*				*									
Policy and Budget Analyst		*			*	*	*							
Program Fiscal Analyst	*						*							
Public Utilities Financial Analyst		*			*	*	*							
Public Utilities Rate Analyst		*			*	*	*							
Sales Analyst	*						*							
Senior Review Examiner (Financial Department)		*					*							
Wage and Salary Specialist		*					*							
Accountancy OTG														
Account Services Director	*									*				
Accountant	*		*	*	*	*	*							
Accountant/Office Manager (Management Information System)				*	*	*								
Accountant, Sponsored Research				*		*								
Accounting Manager	*				*		*							
Accounting Officer				*		*								
Accounting Specialist	*					*								
Accounting Specialist (Budgets)		*				*								
Accounting Supervisor	*						*							
Accounting Systems Coordinator				*		*								
Auditor II and III	*			*	*		*	*						
Chief Accountant	*			*	*									
Chief of Tax Regulations		*			*									
Coordinator of Financial Records				*			*							
Cost Accountant	*				*	*								

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Accountancy OTG (continued)														
Director of Accounting				*	*									
Director, Division of Accounts and Reconstruction			*		*									
Educational Facilities Fiscal Services Superviser		*					*							
Educational Financial Program Auditor		*					*							
Executive Secretary to Accounting Vice President	*					*								
Executive Vice President, Accounting and Control		*			*									
Fiscal Control Technician		*					*							
Head Accountant	*					*								
Internal Auditor	*			*			*		*					
Manager, Retail Accounting	*				*									
NCR Operator and Accountant	*								*					
Payroll Chief	*					*								
Senior Accountant	*						*					*		
Staff Accountant			*				*							
Statistical Accountant				*		*								
Systems Accountant (Management Information System)			*		*									
Tax Audit Administrator		*			*									
Tax Manager		*			*									
Tax Processing Specialist		*									*			
Tax Technician		*				*	*				*			
Budget Control OTG														
Assistant Director, Budget Accounting		*			*									
Budget Analyst		*	*	*	*		*							
Budget Analyst II			*		*									
Budget Director				*	*									
Budget and Financial Bureau Chief		*			*									
Budget Officer				*	*									
Budgets and Planning Coordinator	*				*									
Chief of Budget Unit		*				*								
Cost Manager	*				*									
Deputy Director of Budget		*					*							
Director, Budget Accounting				*	*									
Manager, Budgeting and Financial Analysis	*				*									
Program Assistant (Budgets)			*				*							

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
INFORMATION SERVICES WORKFIELD														
Management of Information Services/Systems OTG														
Administrative Analyst (Office of Information Services)				*					*					
Administrator, Information Systems Bureau		*			*				*					
Administrator of Literature and Information Systems	*				*									
Assistant Information Officer		*				*								
Associate Director of Information Services				*	*									
Director, Hospital Information System				*	*									
Director of Information Services	*		*	*	*									
Director of Information Systems				*	*									
Director of Information Systems Planning	*				*									
Director, Management Information Services		*			*									
Executive Vice President of Systems and Information Services Group	*				*									
Extension Specialist (Headquarters Information Staff)			*		*	*					*			
Information Officer	*				*									
Information Officer I and II		*				*								
Information Services Administrator	*					*								
Information Services Manager	*				*									
Information Services Supervisor	*				*									
Information Specialist			*		*	*								
Information Specialist I, II, and III		*			*	*	*	*			*	*		
Information Specialist (Administrative Services)	*					*		*						
Information Systems Executive		*			*									
Manager, Information and Communication	*				*									
Manager, Information Services	*				*								*	
Manager, Information Services Division		*			*									
Regional Information Services Manager	*				*									
Resource Information and Education Officer		*										*		
Staff Specialist Data Systems (Planning and Support)	*				*									
Supervisor, Information Scientists (Information Retrieval Services)	*				*									
Supervisor, Information Services	*				*									
Supervisory Manager, Information Services	*								*					
Systems Manager (Information Services)	*				*									

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Marketing of Information Services/Systems OTG														
No unique titles reported for this survey														
Educational Information OTG														
Administrator, Educational Information Management Systems		*			*									
Assistant Division Director (School Placement)		*			*									
Associate, Educational Services	*								*					
Director of Divisional Educational/Information		*			*									
Director, Educational Communication				*	*									
Director, Educational Services	*				*									
Director of Academic News Bureau				*										*
Dissemination/Planning Coordinator (Educational Services)	*					*								
Division Director, Educational Services	*				*									
Information System Director, Education		*			*									
International Officers (Educational Information)				*		*	*	*						
Regional Field Coordinator (Educational Services)	*							*						
Senior Associate (Educational Services)	*								*					
Social Superintendent (School Placement Services)		*			*									
Specialist I, Educational Services	*						*							
Specialist II, Educational Services	*						*							
Superintendent, Central Office (Schools District)		*			*									
Systems Analyst, Education Services	*								*					
Writer/Developer, Educational Services	*					*					*			
Government Information OTG														
Chief, Serial and Government Publications Section (of Library)			*		*									
Head, Government Publications Section (of Library)			*		*									
Health/Legal/Welfare Information OTG														
Administrative Officer (Alcohol and Drug Abuse)		*				*								
Attorney			*				*							
Attorney - Office of General Counsel			*				*							
Benefits Coordinator (Employee Benefits)		*					*							
Director of Medical Records	*				*	*								
Director, Office of Employment (Security Automation Program)		*			*									

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Director of Sports Information				*										*
Executive Vice President, Legal Offices	*				*									
Facility Manager I (Medical School)				*						*				
Facility Manager II (Medical Center)				*						*				
Health Planning Specialist		*			*	*								
Information Specialist (Welfare)		*				*								
Information System Director, Health		*			*									
Job Service Specialist		*					*							
Legal Analyst		*					*							
Legal Publications Officer			*			*								
Legislative Specialist			*								*			
Medicaid Management Information Supervisor		*		*	*									
Medical Records Director	*					*								
Medical Records Librarian	*		*	*		*					*			
Medical Records Manager				*		*								
Medical Records Specialist	*			*		*								
Medical Records Supervisor		*		*		*								
Mental Health Information Specialist		*					*							
Patient Care Coordinator	*						*							
Patient Education (in hospital)	*											*		
Project Director (Medical Research)		*						*						
Safety and Training Dispatchers		*				*								
State Law Librarian		*									*			
Vital Statistics State Registrar		*			*									
Vice President, Legal and Administrative	*				*			*						
Public and Consumer Information OTG														
Assistant Director, Office of Public Information				*	*									
Assistant Information Officer (Public Information)		*				*								
Assistant to the President - Public Relations				*	*									
Assistant Outreach Coordinator	*					*								
Assistant Public Information Director		*												
Assistant Vice President, Customer Services (Communications)	*				*									
Commodity Information and Distribution Specialist		*				*								
Consumer Education Specialist			*					*						
Consumer Protection Specialist			*				*							
Consumer Relations Coordinator	*				*									

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Public and Consumer Information OTG (continued)														
Consumer Specialist	*					*								
Customer Service Agent	*					*								
Director, Customer Relations (Telephone Information)		*				*								
Director, Information and Public Relations	*				*									
Director (Information Specialists)				*	*									
Director of Public Information				*	*	*								
Economist (Consumer Protection)			*				*							
EM-S Services Coordinator (Information and Communications)	*				*									
Executive Secretary to Vice President of Public Relations/Publications	*					*								
Executive Vice President, Corporate and Public Affairs	*				*									
Fish and Wildlife Research Information and Education Officer		*				*								
Food and Drug Specialist (Consumer Protection)			*				*							
Information Officer		*				*								
Information Specialist (Public Affairs)				*		*								
Information Specialist I (Public Relations)				*		*								
Manager, Constituent Relations (Office of Public Information)				*	*									
Manager, Public Relations	*				*									
Manager, Selective Dissemination Information Branch		*			*									
Mathematician (Consumer Protection)			*				*							
Outreach Coordinator	*							*						
Patients' Relations Coordinator (Quality Assurance Department)	*							*						
Public Affairs Director	*				*									
Public Affairs Officer	*			*	*	*		*						
Public Information Assistant		*			*	*								
Public Information Coordinator	*					*								
Public Information Director I				*	*									
Public Information Officer		*	*	*	*	*	*	*						
Public Information Specialist	*	*	*		*	*	*							
Public Information Unit Director		*			*									
Public Services Executive (Information Services)		*			*									
Public Services Officer (Taxpayer Services)			*											*
Research Analysts (Public Relations and Development)				*		*								
Senior Customer Services Representative	*					*								
Senior Information Specialist (Office of Public Information)				*	*									
Supervisor - Research Analysts (Public Relations and Development)				*	*									
Supervisory Writer/Editor (Public Affairs)			*		*									

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Tax Education Specialist		*				*								
Tax Technicians (Taxpayers Assistance Bureau)		*						*						
Technical Information Specialist (Consumer Protection)			*				*							
Writer/Editor (Public Affairs)			*			*								
Scientific and Technical Information OTG														
Agricultural Economist			*				*							
Air Pollution Control Specialist		*				*	*							
Assistant Chief, Science Policy Research Division			*		*									
Assistant Chief for Technology (in Library)			*		*									
Associate Scientist (Energy Division)				*									*	
Biological Science Analyst			*				*							
Biological Scientist (Science Policy Research)			*				*							
Chief, Science and Technology Division (of Library)			*		*									
Database Librarian (Agriculture)			*			*								
Chemist (Information Services)			*				*							
Chief Engineer, Flood Plain Regulation		*			*									
Chief, Science Policy Research Division (in Library)			*		*									
Civil Engineer (Program Development)			*		*									
Conservation Program Officer		*			*									
Control Engineer	*												*	
Deputy Water Commissioner		*			*									
Director, Engineering Division				*	*									
Director and General Manager, Toxicology	*				*									
Director, Technical Services	*						*							
Economist (Information Analysis)			*			*								
Economist (Regional Affairs)			*				*							
Editor (Agricultural Experiment Station)				*		*								
Electrical Engineer	*												*	
Electrical Engineering Manager (Technical Information)	*					*								
Engineer (Environmental and Natural Resources Policy Research)			*				*							
Engineer	*	*	*		*								*	
Engineer (Research Division of Library)			*				*							
Environmental Information Analyst			*				*							
Flood Plain Engineer		*			*									
Geologist				*		*	*	*						
Highway Environmental Analyst		*				*	*							

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Scientific and Technical Information OTG (continued)														
Hydrologist		*				*	*	*						
Information Assistant	*					*								
Information Specialist (Plans, Procedures, Data Control)	*					*								
Manager, Scientific Analysis	*						*							
Manager, Technical Information Services	*				*									
Manager of Technical Support	*						*							
Marketing Manager (Technical Information)	*						*							
Mechanical Engineering Manager (Technical Information Unit)	*					*								
Meteorologist		*					*							
Operations Research Analyst (Science Policy Research Division)			*				*							
Physical Sciences Analyst (in Library)			*				*							
Physical Scientist (Information Services Section)			*				*							
Process Engineer	*					*								
Psychologist			*			*	*	*						
Quality Control Manager (Technical Information)	*						*							
Realty Specialist			*				*							
Referral Specialist				*				*						
Regional Economist (Planning Division)			*				*							
Scientist	*												*	
Searcher (Technical Information)				*				*						
Scientist/Engineer (Energy Division)				*									*	
Senior Scientist (Energy Division)	*			*	*								*	
Sensing Specialist, Information Resources Unit		*						*						
Supervising Control Specialist (Air Pollution)		*			*									
Supervisor (Agricultural Information Unit)			*		*									
Supervisor, Technical Information	*							*						
Supervisor, Air Pollution Control Systems		*			*									
Supervisory Technical Information Specialist			*		*									
Technical Analyst	*						*							
Technical Assistant	*					*		*						
Technical Information Specialist	*			*				*						
Technical Specialist, Information Resources		*				*	*	*			*			
Telecommunications Engineer	*										*			
Transportation Engineer (Systems Division)	*									*				
Transportation Supervisor		*				*								
Vice President of Customer Services (Data Processing)	*				*									
Writer, Agricultural Experiment Station				*		*								

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
LIBRARY WORKFIELD														
Library Management OTG														
Administrative Librarian (Medical Sciences)			*		*									
Administrator (Library)				*	*									
Assistant Chief Librarian				*	*									
Assistant Director of Libraries				*	*	*		*						
Assistant State Librarian		*			*									
Associate Director, Library	*				*									
Associate Director, Library Operations				*	*									
Associate Director, Library Systems Analysis and Design				*	*									
Associate Director of University Libraries				*	*									
Associate Librarian				*		*								
Associate Library Director	*				*									
Chief, Library Services		*	*		*									
Director of the Curriculum Library				*	*									
Director, Library	*			*	*									
Director, Library Resources				*	*									
Director, Library Services	*			*	*									
Director, Medical Library	*				*									
Director, Network Development Office (Library)			*		*									
Director of State Library		*			*									
Director of University Libraries				*	*									
District Librarian		*				*								
Division Head (Library)				*	*									
Elementary Librarian		*			*									
Head Librarian				*	*									
Librarian	*	*		*	*	*					*			
Librarian (rank of Professor)				*	*									
Library Administrator	*	*		*	*									
Library Coordinator		*			*									
Library Director			*		*									
Manager (of Library)	*				*									
Principal Librarian		*									*			
Program Administrator (Library)				*	*									
Program Director (Library)		*			*									
Section Head (Research Division of Library)			*		*									
University Librarian				*		*	*	*						

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Archives Management OTG														
Archivist		*	*	*	*	*					*			
Assistant Archivist				*		*								
Manager (Archives)				*	*									
Senior Archivist		*						*						
State Archivist		*			*									
Bibliography OTG														
Assistant Bibliographer				*		*								
Bibliographer			*	*		*								
Bibliographer and Searcher				*		*								
Chief Bibliographer			*			*								
Head, Bibliographic Section (in Library)			*		*									
Head, Reference and Bibliographic Section (in Library)			*		*									
Book Reviewer	*					*								
Library Systems Automation OTG														
Assistant Director, Systems Development (Library)			*		*									
Assistant Director, Systems Engineering (Library)			*		*									
Bibliographic Systems Specialist			*							*				
Chief, Automation Planning and Liaison Officer			*		*									
Chief, Engineering Planning and Development (Library)			*		*									
Chief, Systems Programming Office (Library)			*		*									
Chief, Technical Systems Office (Library)			*		*									
Department Assistant Director, Systems Development (Library)			*		*									
Department Assistant Director, Systems Engineering (Library)			*		*									
Director, Automated Systems Office (Library)			*		*									
Head, Computer Applications Section			*		*									
Library Information Systems Specialist			*						*					
Manager, Automated Data Processing (Library)			*		*									
Senior Automation Planning Specialist (Library)			*						*					
Senior Information Systems Project Manager (Library)			*							*				
Senior Library Information Systems Specialist			*						*					

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Reference and Searching OTG														
Assistant Librarian for Research Services			*		*									
Assistant Manager and Reference Specialist		*						*						
Assistant Reference Librarian				*				*						
Circulation - Reference Librarian				*		*								
Head, Readers' Services				*	*			*			*			
Head of Reference				*				*						
Head Reference Librarian				*				*						
Head, Reference and Reader Service Section (of Library)			*		*									
Head, Referral Section			*		*									
Information Counselor	*			*			*	*						
Information Researcher		*						*						
Information Scientist (Information Retrieval Service)	*							*						
Information Services Librarian				*		*		*						
Information Unit Supervisor (in Library)			*		*									
Librarian	*	*				*		*						
Librarian (Bibliography/Research/Reference)				*		*								
Library Researcher	*					*								
Library Specialist, Reference	*										*			
Manager (Reference Services Branch)		*			*									
Outreach Supervisor (Library)	*				*									
Reference Librarian	*	*	*	*	*	*	*	*						
Reference Specialist			*					*						
Referral Specialist	*							*						
Research Analyst (in Library)			*				*							
Research Librarian	*					*								
Searcher	*							*						
Senior Reference Librarian			*					*						
Subject Specialty OTG														
Art Librarian				*		*								
Assistant Chief, Music Division (Library)			*		*									
Assistant Chief, Rare Books Division (Library)			*		*									
Chief Information Specialist		*			*									
Chief, Prints and Photographs Division			*		*									
Chief, Serial Record Division (of Library)			*		*									
Collections Specialist			*			*								

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Subject Specialty OTG (continued)														
Computer Science Librarian				*		*								
Curriculum Librarian				*				*						
Dental Librarian				*							*			
Director, Special Collections			*		*									
Documents Librarian				*		*								
Documents Specialist				*		*								
Fine and Rare Books Librarian				*		*								
Governments Documents Librarian				*		*		*						
Head, Newspaper Section (of Library)			*		*									
Head of Periodicals Section (of Library)			*	*	*			*						
Head, Subject Specialty Section (of Library)			*		*									
Information Services Librarian				*		*								
Information Specialist (in Library)		*						*			*			
Law Librarian			*	*	*									
Legal Research Assistant (in Library)			*				*							
Librarian	*	*	*	*	*	*	*	*		*	*			
Librarian I, II and III	*				*	*		*						
Librarian (Fine Arts)			*				*							
Librarian (Medical-Biological Science)			*			*								
Librarian (Personnel)	*							*						
Librarian (Special Collections)				*		*		*			*			
Library Specialist: Text	*										*			
Literature Analyst	*					*								
Media Specialist/Librarian	*					*								
Microfilm Librarian	*					*								
Music Librarian				*		*		*			*			
Non-Print Librarian				*							*			
Periodicals Librarian				*		*					*			
Photo Librarian	*							*						
Print Librarian				*							*			
Program Librarian	*										*			
Records Librarian				*				*						
School Librarian		*			*									
Senior Language Specialist (Research Library)			*			*								
Serials Librarian				*			*							
Subject Matter Specialist				*			*							

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Supervisor, Periodicals				*							*			
Technical Information Specialist (Library)			*			*								
Text Librarian	*							*						
Technical Services OTG														
Abstractor	*			*		*								
Abstractor/Indexer		*				*								
Acquisitions/Medical Records Librarian				*							*			
Analyst (Library)				*					*					
Assistant Librarian, Processing Services				*	*									
Archivist/Cataloger				*		*								
Assistant Acquisitions Librarian				*							*			
Assistant Cataloging Librarian				*		*					*			
Assistant Circulation Librarian				*							*			
Assistant Head Cataloger				*		*								
Assistant Librarian				*		*		*						
Assistant Librarian (Data Preparation)	*					*								
Assistant Librarian (Library Systems)				*					*					
Associate Administrative Analyst (Library)				*					*					
Automation Officer (Library Research Services)			*						*					
Cataloger	*			*		*								
Cataloging Group Supervisor	*					*								
Cataloging Librarians				*							*			
Cataloging Reference Librarian	*					*								
Chief, Library Services Division			*		*									
Chief, User and Product Services (Library)			*		*									
Circulation Librarian				*	*			*			*			
Classifier (Reference Library)				*		*								
Coordinator of Resources (Library)			*								*			
Editor-Indexer	*					*								
General Services Librarian				*	*									
Head, Acquisitions Department				*							*			
Head Acquisitions Librarian				*							*			
Head Cataloger				*		*								
Head, Cataloging Department				*	*						*			
Head, Cataloging Unit			*		*									

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Technical Services OTG (continued)														
Head of Circulation				*				*						
Head, Resources Analysis Section (Library)			*		*									
Head, Technical Services				*	*			*						
Head, Technical Services Section			*		*									
Librarian, Acquisitions	*			*	*			*			*			
Librarian, Acquisitions/Inventory				*							*			
Librarian, Cataloging Processes				*		*								
Librarian (Data Processing in Library)	*							*						
Librarian, Serial Catalog Processing				*		*								
Library Assistant		*			*			*			*			
Library Assistant - Photographs	*										*			
Library Circulation Superintendent	*					*								
Library Technical Assistant I, II, III, IV				*		*								
Library Technician			*	*		*		*			*			
Microfilm Processor/Cataloger	*										*			
Principal Librarian (Information Systems)		*							*					
Publications Unit Supervisor (Library)			*		*									
Supervisor, Circulation Department				*							*			
Supervisor, Library		*									*			
Supervisor, Order Department (in library)				*							*			
Supervisor, Special Projects Unit (in library)			*		*									
Systems Librarian	*										*			
Technical Editor (Research Division of Library)			*		*	*								
Technical Librarian (Technical Services)	*										*			
Technical Services Librarian				*	*						*			
Technical Services Supervisor (Library)	*				*									
Technical Specialist (Library)		*				*		*					*	
Transcriptor	*					*								
Translator Editor (Abstracting and Indexing)	*					*								
Senior Staff Analyst (Technical Services)			*							*				
Specialist, Information and Automated Systems (Library Services)			*						*					

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR *				FUNCTION *									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
MANAGEMENT SUPPORT WORKFIELD														
Management Analysis/Services OTG														
Administrative Assistant		*			*		*	*			*			
Administrative Assistant (Management Information System)		*				*								
Administrative Program Specialist		*			*			*						
Administrator, Internal Control	*	*			*									
Administrator, Management Services		*			*									
Assistant Director, Information Systems				*	*									
Assistant Director, Management Information System	*									*				
Assistant Manager, Information Systems	*										*			
Assistant (VP) President for Information Systems				*	*									
Associate Director, Provost's Office				*	*									
Branch Manager, Management Information System	*				*									
Business Manager	*							*						
Business Manager, Operations	*				*									
Business Office Manager				*	*									
Chief, Management Information System		*			*									
Coordinator, Management Information System		*			*									
Corporate Systems Analyst	*								*					
Corporate Systems Manager	*				*									
Department Head, Information Systems	*				*									
Director, Management Information System	*	*	*	*	*									
Director, Management Services			*		*									
Director, Management Systems				*	*									
Director, Policy and Management	*				*									
Director, Provost's Office				*	*									
Director, Quality Control	*				*									
Distribution Operations Manager	*				*									
Executive Vice President, In-Service Operations	*				*									
Executive Vice President, International Department	*				*									
Executive Vice President, Operations	*				*									
General Manager (in charge of Management Information System)	*				*									
Group Supervisor, Information Alerting Service	*				*									
Group Supervisor, Information Systems	*				*									
Group Supervisor, Plans and Procedures	*				*									

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR *				FUNCTION *									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Management Analysis/Services OTG (continued)														
Information Officer, Management Services		*				*								
In-Service Director	*										*			
Management Analyst	*	*	*	*	*	*	*	*		*				
Management Consultant	*									*				
Management Information Analyst (Special Projects)	*				*									
Management Information Coordinator (MIS)			*		*									
Management Information Manager		*			*									
Management Information System Specialist	*						*							
Management Methods Analyst				*					*					
Management Services Analyst	*				*		*							
Management Support Officer (Data Processing)			*		*									
Management Systems Consultant	*												*	
Management Systems Coordinator				*	*									
Manager (Business Office)	*				*									
Manager of Executive Systems Development				*	*									
Manager, Management Information System	*				*									
Manager, Management Systems	*								*					
Manager, Management Systems Analysis				*	*									
Manager, SIS Information Systems				*	*									
Materials Manager	*				*									
Plant Manager	*								*					
President, Management Information System	*				*									
Production Manager	*				*		*	*						
Quality Assurance Manager	*							*						
Quality Control Director	*							*						
Senior Vice President (Management Information System)	*				*									
Supervisor/Management Analyst (Management Info. System)			*		*		*							
Support Services Supervisor			*		*									
System Administrator (Management Information System)			*		*									
Vice President, Corporate Affairs (Communications)	*				*									
Vice President, Management Information System	*				*									
Vice President and Provost, Resource Management				*	*									

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TITLE by OCCUPATIONAL TITLE GROUP (OTG)	SECTOR*				FUNCTION*									
	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Administrative Systems and Services OTG														
Administrative Analyst	*						*		*					
Administrative Analyst I, II, III		*							*					
Administrative Assistant, Information Systems				*		*								
Administrative Manager	*				*									
Administrative Project Coordinator				*	*									
Administrator, Internal Control		*			*									
Analyst (Administrative Applications)				*					*					
Data Administrator (Administrative Services)	*									*				
Director, Administrative Services	*	*			*									
Director of Administrative Systems				*	*									
Division Director (Administrative Services)	*				*									
Editorial Word Processors (Administrative Division)	*										*			
Executive Assistant, Administrative Services		*			*									
Facilities and Purchasing Coordinator (Administrative Services)	*						*							
Manager, Administrative Applications				*	*									
Office Manager	*				*							*		
Vice President, Administration	*				*									
Vice President, Administrative Services				*	*									
Word Processing - Automated Transcription Specialist		*				*								
Word Processing CPT				*		*								
Word Processing Manager		*				*								
Word Processing Systems Analyst	*								*					
Word Processing Systems Planner	*								*					
File and Records Management OTG														
Custodian of Records		*									*			
Director, Admissions and Records				*	*	*	*	*						
Division Staff Manager (Customer Records)	*				*									
Manager, Records and Reports				*	*									
Manager, Student Records				*	*									
Records Analyst II				*			*							
Records and Communications Analyst		*				*								
Records and Communications Assistant		*					*							
Records and Communications Transcription Supervisor		*									*			

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
File and Records Management OTG (continued)														
Records Technician (Hospital)	*					*								
Registrar (University)				*	*									
Research Analyst, Evaluation and Records		*					*							
Supervisor, Order Department (in charge of records)				*							*			
Supervisor of Records		*									*			
Supervisor, Records Section		*								*				
Personnel Information OTG														
Assistant Director, Personnel	*			*		*								
Assistant Personnel Director (Technical Information Unit)		*				*								
Classification Computer Analyst (Personnel)		*											*	
Director of Nursing Information Systems	*				*									
Director (Personnel)				*		*								
Director (Personnel and Public Relations)	*				*									
Employee Information Systems Coordinator	*							*						
Employee Relations Manager	*				*									
Examination Development Specialist (Personnel Division)		*											*	
Executive Vice President, Industrial Affairs	*				*									
Law and Rule Specialist (Personnel Division)		*											*	
Manager, Computer Classification Development (Personnel)		*			*									
Manager, Employee Benefits		*			*									
Manager, Evaluation and Administrative Services (Personnel)		*			*									
Manager, Examination Development (Personnel)		*			*									
Manager, Evaluation and Administrative Services (Personnel)		*			*									
Manager, Support Services (Personnel)		*			*									
Personnel Director	*			*	*	*						*		
Personnel Liaison Officer (Technical Information Unit)		*					*							
Personnel Management Specialist			*	*	*	*	*	*		*		*		
Personnel Manager	*					*						*		
Personnel Operations Field Technician		*				*								
Personnel Records and Systems Manager	*					*								
Personnel Specialist		*		*			*	*						
Personnel Specialist (Management Information System)			*			*			*					
Project Development Specialist (Personnel)	*							*						
Staff Analyst				*					*					
Supervisor, Operations and Services (Personnel)		*			*									

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Planning Information OTG														
Administrative Analyst, Planning Bureau		*					*		*	*				
Assistant Director, Planning Bureau		*			*									
Assistant Vice President, Systems Planning and Support	*				*									
Associate Director, Policy and Management	*				*									
Chief, Planning and Technical Services		*			*									
Corporate Planner	*							*						
Deputy Director, Planning and Coordination		*			*									
Development Director				*		*								
Director of Information Planning	*									*				
Director of Planning				*		*								
Director, Planning Bureau		*			*									
Director of Planning, Management and Evaluation				*	*									
Director, Planning and Technical Services			*		*									
Director (Policy and Management)	*					*								
Division Director (Planning and Program Coordination)	*				*	*								
Division Staff Manager, Technical Support (Planning Department)	*				*									
Environmental Resources Planner		*			*									
Executive Director (Policy and Management)	*				*									
Feasibility Planner	*					*								
Planning Analyst III		*			*	*	*	*	*					
Planning Officer				*	*	*	*	*						
Project Co-Director (Planning and Program Coordination)	*						*							
Project Director, Strategic Planning Systems	*									*				
Senior Associate, Planning and Program Coordination	*				*									
Specialist I, Planning	*						*							
State ADP Planning Coordinator		*			*									
Supervisor, Strategic Planning Systems	*										*			
Vice President for Planning and Informational Services				*	*									
Marketing Information OTG														
Account Executive	*						*							
Advertising Manager	*				*									
Assistant Advertising Manager	*					*								
Associate Advertising Manager	*					*								

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Marketing Information OTG (continued)														
Director of Marketing	*	*			*									
Distribution Manager	*				*									
Executive Vice President, Purchasing Operations	*				*									
Inspector (Quality Assurance)	*				*	*								
Manager, Marketing Communication	*				*									
Marketing Associate	*						*							
Marketing and Development Research Analyst			*				*							
Marketing Director	*					*								
Marketing Manager	*				*									
Marketing Specialist	*		*				*	*						*
Purchasing Analyst		*				*	*							
Sales Analyst	*						*							
Sales Supervisor	*				*									
Supervisor of Merchandising Systems	*				*									
Supply Marketing Manager	*				*									
Vice President of Marketing	*				*									
Vice President, Purchasing (Management Information)	*				*									
Warehouse Manager	*				*									
RESEARCH WORKFIELD														
Management of Research OTG														
Assistant Director (Research)				*			*							
Assistant Director (Research and Development)	*												*	
Assistant Director, Research and Planning		*									*			
Assistant Director (Research and Statistics Bureau)		*				*								
Assistant Manager (Research and Development)	*												*	
Assistant Research Manager	*												*	
Associate Director for Research and Analysis		*			*									
Bureau Chief (Research and Statistics)		*			*		*							
Chief of Economic Research		*			*									
Chief (Research Unit)		*											*	
Consultant in Research and Development		*				*								
Coordinator (Research and Analysis)				*				*						
Coordinator of the Research Unit				*									*	
Director, Bureau of Business and Economic Research				*									*	

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Director, Center for the Study of Private Enterprise				•									•	
Director, Promotional Research	•										•			
Director of Promotions and Research	•				•									
Director (Research)				•			•							
Director of Research		•			•									
Director (Research and Analysis)		•			•									
Director/Research Associate				•	•									
Director (Research and Development)	•						•							
Director, Research and Information Services				•	•									
Director, Research and Operations	•												•	
Director, Research and Planning		•			•									
Director, Research and Statistics Bureau		•			•									
Director/Social Research Assistant				•			•							
Director of Sponsored Research				•	•									
Director of Tax Systems Development and Research		•			•									
Director, Urban and Environmental Research				•	•									
Manager, Research and Analysis		•												
Manager, Research and Development	•				•	•	•						•	
Manager (Research and Reporting)		•			•									
Manager of Research, Special Projects, and Reports				•	•									
Research Chief		•					•							
Research Coordinator				•	•									
Research Director	•			•	•									
Research Manager	•												•	
Research Project Coordinator			•								•			
Senior Research Coordinator	•							•						
Supervisor, Research and Analysis		•				•								
Vice President and General Manager, Research Department	•				•									
Vice President (Research and Development)	•				•									
Research - General OTG														
Administrative Assistant (Research Unit)		•											•	
College University Administrators (Research Specialists)				•			•							
Communications Researcher	•												•	
Computer Scientist (Research and Development)	•												•	
Engineer (Research and Development)	•				•	•	•	•	•				•	

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Research - General OTG (continued)														
Engineering R & D Specialist	*												*	
Estimator (Research and Development Unit)	*						*							
Operations Researcher	*								*				*	
Research Assistant	*	*		*		*	*	*						
Research Assistant, Office of VP Administrative Services				*			*							
Research Associate	*			*		*	*	*					*	
Research Librarian				*		*								
Research Methodologist				*									*	
Research Scientist				*									*	
Research Specialist				*		*	*	*						
Researcher	*	*					*	*					*	
Researcher/Statistician		*			*	*	*							
Senior Information Scientist	*					*								
Social Science Researcher		*											*	
Systems Researcher (Technical Information Unit)	*									*				
Research - Institutional OTG														
Administrative Assistant (Institutional Research)				*			*							
Assistant Director, Institutional Research				*				*						
Assistant Vice President for Institutional Research				*	*									
Community Assessment Specialist (Institutional Research)				*		*	*							
Coordinator, Institutional Research				*			*							
Director, Research and Planning (Institutional)				*	*									
Director, Institutional Analysis				*	*									
Director, Institutional Research				*	*	*	*	*						
Executive Assistant to the President (Research)				*									*	
Institutional Reporting Specialist				*										*
Institutional Research Analyst				*			*							
Librarian, Institutional Research				*			*							
Registrar/Director of Institutional Research				*	*						*			
Registrar/Director of Special Research				*		*								
Statistical Assistant, Institutional Research				*		*	*							
Statistical Research Assistant (Institutional Research)				*			*							

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Information/Research Analysis OTG														
Analysis Specialist	*				*		*							
Analyst (Research and Analysis Unit)	*	*					*							
Data Analyst (Research)				*			*							
Data Management and Research Analyst I, II, III				*			*							
Economist (Research and Analysis)		*					*							
Manpower Research Economist (Research and Analysis)		*				*	*							
Methods Analyst	*									*				
Operations Analyst	*						*							
Production Analyst	*						*							
Regulatory Affairs Analyst				*									*	
Research Analyst	*	*	*	*		*	*		*	*	*		*	
Resource Economist (Data Analysis Unit)		*					*							
Program and Equipment Evaluation OTG														
Administrative Assistant (Program Development & Evaluation)		*			*									
Administrative Program Analyst			*	*			*							
Assistant Director, Division of Program Dev. and Evaluation		*			*									
Assistant Director, Evaluation, Research, and Assessment	*				*									
Assistant Director, Hardware/Software Evaluation				*			*							
Data Analyst, Evaluation, Research, and Assessment	*						*							
Director, Evaluation, Research, and Assessment	*				*									
Director of Hardware Systems				*	*									
Director, Program Development and Evaluation				*	*									
Division Director, Evaluation, Research, and Assessment	*				*									
Division Director, Planning and Program Coordination	*				*									
Educational Program Planning/Evaluation Manager		*			*									
Education State Program Administrator		*			*									
Equipment Specialist (Meteorology)			*			*								
Evaluation and Monitoring Specialist		*					*							
Evaluation Specialist	*						*							
Manager, Evaluation and Monitoring Unit		*			*									
Program Analysis Officer (Information Services)			*		*									
Program Analyst			*		*	*	*			*	*			

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Program and Equipment Evaluation OTG (continued)														
Program Analyst (Construction)			*				*							
Program Analyst (Engineering)			*			*	*							
Program Assistant			*				*							
Program Development Specialist		*				*	*							
Program Research Specialist		*					*							
Research Associate, Evaluation, Research, and Assessment	*						*							
Senior Associate, Evaluation and Research	*					*								
Senior Computer Equipment Systems Analyst			*							*				
Special Services Program Coordinator		*			*									
Supervisory Computer Equipment Analyst			*								*			
Writer-Editor, Evaluation, Research, and Assessment	*										*			
STATISTICAL WORKFIELD														
Management of Statistical Services OTG														
Chief, Statistical Unit		*						*						
Director, Statistical and Computer User Services				*	*									
Statistical/Mathematical Analysis OTG														
Demographer		*					*							
Mathematical Statistician (Communications and Data Services)			*				*							
Research Statistician		*					*							
Statistical Analyst		*		*			*							
Statistical Analyst (Vital Records, Health Information Unit)		*				*	*							
Statistical Assistant				*			*							
Statistical Research Assistant				*		*	*							
Statistician	*	*	*	*		*	*						*	
Statistician/Data Manager				*			*							
Statistical Programming OTG														
Data Quality Coordinator (Statistical)	*						*							
Data Quality Manager (Statistical)	*				*									
Statistical Program Analyst			*				*							
Statistical Program Coordinator			*		*									
Statistician/Programmer				*							*			

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
TECHNICAL PUBLICATIONS WORKFIELD														
Document Production OTG														
Composing and Formulating Director	*									*				
Compugraphic Head	*				*									
Director, Print Shop				*	*									
Illustrator (Research and Reporting Unit)		*				*								
Manuals Designer	*					*								
Production Editor (Metallurgy)				*		*								
Production Manager (Technical Publications)	*				*									
Word Processors (Editorial)	*								*					
Technical Reports/Documentation OTG														
Assistant Director (Technical Reports)	*						*							
Director of Internal Publications	*				*									
Director of Publications				*	*									
Director of Publications/Librarian	*				*	*								
Director, Research and Development (Technical Reports)		*				*								
Documentation Specialist	*					*								
Field Liaison Engineer, Electrical (Technical Reports)		*											*	
Field Liaison Engineer, General Construction (Technical Reports)		*											*	
Field Liaison Engineer, Location & Design (Technical Reports)		*											*	
Field Liaison Engineer, Maintenance (Technical Reports)		*											*	
Field Liaison Engineer, Structures (Technical Reports)		*											*	
Group Supervisor, Technical Report Service	*				*									
Head, Publications Section (in Library)			*		*									
Manager of Publications	*			*	*									
Publications Assistant		*				*								
Publications Manager	*				*									
Publications Specialist		*			*	*								
Report Reference Specialist	*							*						
Report Specialist (Technical Reports Service)	*					*								
Reporting Supervisor (Technical)		*				*								

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	I	S/L	F	C/U	1	2	3	4	5	6	7	8	9	10
Technical Writing and Editing OTG														
Assistant Editor	*			*		*								
Associate Editor	*													*
Catalog Editor			*			*								
Directing Editor	*				*									
Editor	*		*	*		*								
Editor, Employee Publications	*					*								
Editorial Assistant			*			*								
Information Writer I, II		*				*								
Managing Editor	*				*									
Managing Editor (Tax and Membership)	*				*									
Principal Editor			*			*								
Project Director/Writer	*					*								
Publications Editor (Information Analysis Center)		*					*							
Reference Editor	*				*									
Senior Editor	*													*
Senior Editor (Tax and Membership)	*					*								
Senior Technical Publications Writer			*				*							
Senior Technical Writer	*					*								
Staff Editor	*					*								
Staffwriter (Information Analysis Center)		*					*							
Tax Publication Editor		*				*								
Technical Maintenance Manager (Technical Writing Unit)	*							*						
Technical Publications Writer			*			*								
Technical Writer	*	*	*	*		*								
Technical Writer, Sponsored Research				*		*								
Writer-Editor			*	*		*								
Writer-Editor, Technical Publications			*			*								

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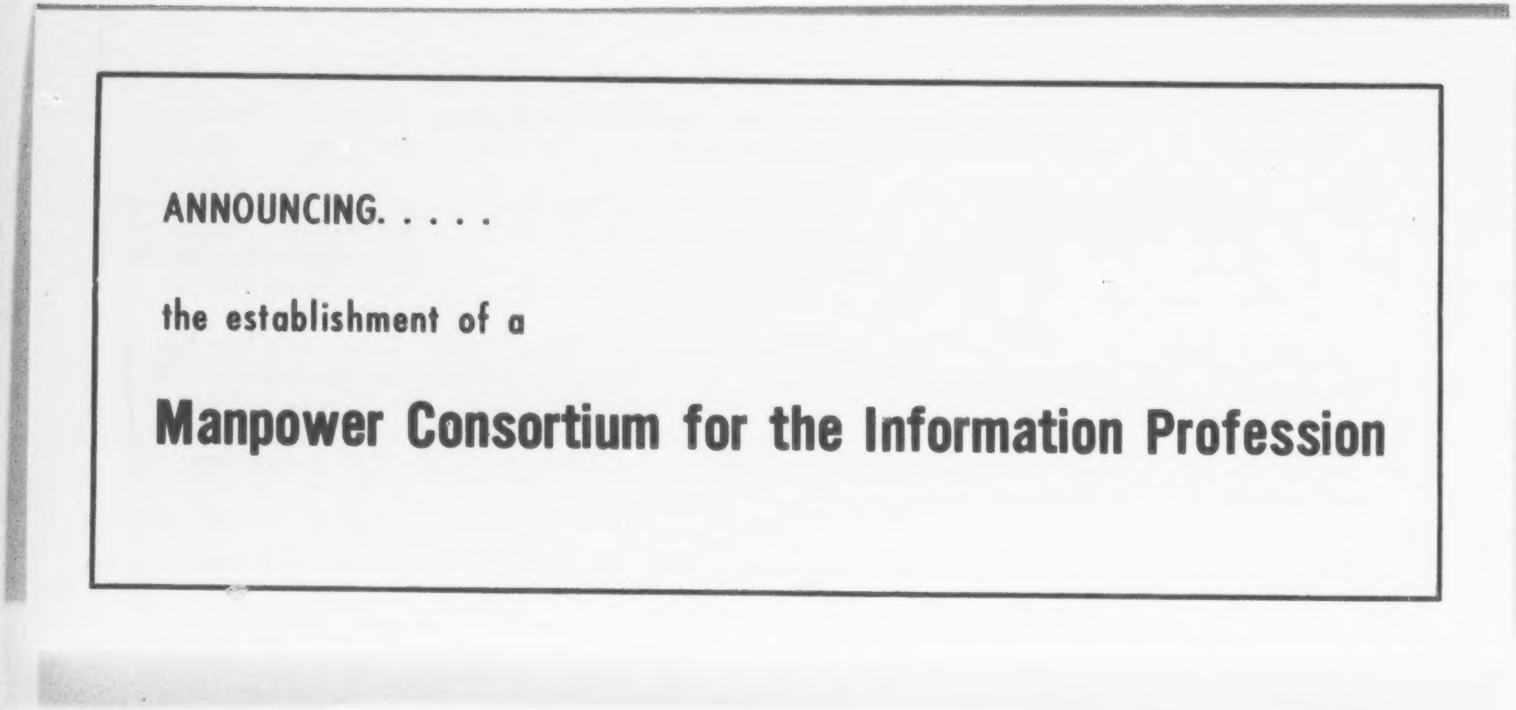
APPENDIX A

Manpower Consortium for the Information Profession



ANNOUNCING. . . . .

the establishment of a

Manpower Consortium for the Information Profession

APPENDIX B

Standard Industrial Classification (SIC) Codes Used in the Sample Drawn from the Industry Sector

Sampling of the Industry sector was confined to those industries designated by the following SIC codes; therefore, the population of industrial organizations for which estimates are provided by the survey is the population designated by these codes.

HIGH INTEREST

271	Newspapers: Publishing, Publishing and Printing
272	Periodicals: Publishing, Publishing and Printing
273	Books
274	Miscellaneous Publishing
731	Advertising
732	Consumer Credit Reporting Agencies, Mercantile Reporting Agencies, and Adjustment and Collection Agencies
735	News Syndicates
737	Computer and Data Processing Services
7391	Research and Development Laboratories
7392	Management, Consulting, and Public Relations Services
823	Libraries and Information Centers
86	Membership Organizations
892	Noncommercial Educational, Scientific, and Research Organizations

MEDIUM INTEREST

28	Chemicals and Allied Products
29	Petroleum Refining and Related Industries
37	Transportation Equipment
38	Measuring, Analyzing, and Controlling Instruments; Photographic, Medical, and Optical Goods; Watches and Clocks
483	Radio and Television Broadcasting
60	Banks
61	Credit Agencies Other Than Banks
62	Security and Commodity Brokers, Dealers, Exchanges, and Services
63	Insurance
821	Elementary and Secondary Schools
824	Correspondence Schools and Vocational Schools
829	Schools and Educational Services Not Elsewhere Classified
84	Museums, Art Galleries, Botanical and Zoological Gardens

891	Engineering, Architectural, and Surveying Services
893	Accounting, Auditing, and Bookkeeping Services
899	Services, Not Elsewhere Classified

LOW INTEREST

10	Metal Mining
11	Anthracite Mining
12	Bituminous Coal and Lignite Mining
13	Oil and Gas Extraction
14	Mining and Quarrying of Nonmetallic Minerals, Except Fuels
15	Building Construction–General Contractors and Operative Builders
16	Construction Other Than Building Construction–General Contractors
17	Construction–Special Trade Contractors
20	Food and Kindred Products
21	Tobacco Manufacturers
22	Textile Mill Products
23	Apparel and Other Finished Products Made From Fabrics and Other Similar Materials
24	Lumber and Wood Products, Except Furniture
25	Furniture and Fixtures
26	Paper and Allied Products
275	Commercial Printing
276	Manifold Business Forms
277	Greeting Card Publishing
278	Blankbooks, Looseleaf Binders, and Bookbinding and Related Work
279	Service Industries for the Printing Trade
30	Rubber and Miscellaneous Plastics Products
31	Leather and Leather Products
32	Stone, Clay, Glass, and Concrete Products
33	Primary Metal Industries
34	Fabricated Metal Products, Except Machinery and Transportation Equipment
35	Machinery, Except Electrical
36	Electrical and Electronic Machinery, Equipment, and Supplies
39	Miscellaneous Manufacturing Industries
40	Railroad Transportation
41	Local and Suburban Transit and Interurban Highway Passenger Transportation
42	Motor Freight Transportation and Warehousing
44	Water Transportation
45	Transportation by Air
46	Pipe Lines, Except Natural Gas
47	Transportation Services
481	Telephone Communication (Wire or Radio)
482	Telegraph Communication (Wire or Radio)
489	Communication Services, Not Elsewhere Classified
49	Electric, Gas, and Sanitary Services

50	Wholesale Trade–Durable Goods
51	Wholesale Trade–Nondurable Goods
52	Building Materials, Hardware, Garden Supply, and Mobile Home Dealers
53	General Merchandise Stores
54	Food Stores
55	Automotive Dealers and Gasoline Service Stations
56	Apparel and Accessory Stores
57	Furniture, Home Furnishings, and Equipment Stores
58	Eating and Drinking Places
59	Miscellaneous Retail
64	Insurance Agents, Brokers, and Service
65	Real Estate
66	Combinations of Real Estate Insurance, Loans, Law Offices
67	Holding and Other Investment Offices
733	Mailing, Reproduction, Commercial Art and Photography, and Stenographic Services
734	Services to Dwellings and Other Buildings
736	Personnel Supply Services
7393	Detective Agencies and Protective Services
7394	Equipment Rental and Leasing Services
7395	Photofinishing Laboratories
7396	Trading Stamp Services
7397	Commercial Testing Laboratories
7399	Business Services, Not Elsewhere Classified
70	Hotels, Rooming Houses, Camps, and Other Lodging Places
72	Personal Services
75	Automotive Repair, Services, and Garages
76	Miscellaneous Repair Services
78	Motion Pictures
79	Amusement and Recreation Services, Except Motion Pictures
80	Health Services
81	Legal Services
83	Social Services

Source: Executive Office of the President: Office of Management and Budget, *Standard Industrial Classification Manual, 1972*, prepared by the Statistical Policy Division. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402; Stock No. 4101-0066.

APPENDIX C

Professional Associations, Societies, and Groups of Interest to Information Workers

The following list of associations, societies, and groups is not intended to be a comprehensive list, but rather to show the wide range of interests of information professionals as reflected in their associations and other groups. The range of interests is consistent with that found in the occupational survey.

For ease of reference, the prepositions "of" and "for" have been ignored in the alphabetical listing.

American Association for the Advancement of Science (AAAS)
1515 Massachusetts Avenue, NW
Washington, DC 20005
[202] 467-4400

American Association of School Libraries (AASL)
50 East Huron Street
Chicago, IL 60611
[312] 944-6780

American Association of Law Libraries (AALL)
53 West Jackson Boulevard
Chicago, IL 60604
[312] 939-4764

American Chemical Society (ACS)
Division of Chemical Information
1155 Sixteenth Street, NW
Washington, DC 20036
[202] 872-4000

American Federation of Information Processing Societies (AFIPS)
210 Summit Avenue
Montvale, NJ 07645
[201] 391-9810

American Library Association (ALA)
50 East Huron Street
Chicago, IL 60611
[312] 944-6780

American Management Associations (AMA)
135 West 50th Street
New York, NY 10020
[212] 586-8100

American Medical Record Association
John Hancock Center Suite 1850
875 North Michigan Avenue
Chicago, IL 60611
[312]

American Society for Cybernetics
c/o College of Education
University of Maryland
College Park, MD 20742
[301] 454-5766

American Society of Indexers
c/o Public Affairs Information Service
11 West 40th Street
New York, NY 10018
[212] 736-6629

American Society for Information Science (ASIS)
1010 Sixteenth Street, NW
Washington, DC 20036
[202] 659-3644

American Statistical Association
806 Fifteenth Street, NW
Washington, DC 20005
[202] 393-3253

Associated Information Managers (AIM)
316 Pennsylvania Avenue, SE
Suite 500
Washington, DC 20003
[202] 544-1969

Association of American Library Schools (AALS)
471 Park Lane
State College, PA 16801
[814] 238-0254

Association of Computer Programmers and Analysts
P.O. Box 95
Kensington, MD 20795
[301] 422-7877

Association for Computing Machinery (ACM)
1133 Avenue of the Americas
New York, NY 10036
[212] 265-6300

Association of Database Producers
Woodside House, Hinksey Hill
Oxford OX1 5BP
England

Association for Development of Computer-Based Instructional Systems
Western Washington State College (Computer Center)
Bellingham, WA 98225
[206] 676-2860

Association for Development of Religious Information Systems
c/o Department of Sociology and Anthropology
Marquette University
Milwaukee, WI 53233
[414] 224-6838

Association for Educational Communications and Technology
1201 Sixteenth Street, NW
Washington, DC 20036
[202] 833-4180

Association for Educational Data Systems (AEDS)
1201 Sixteenth Street, NW
Washington, DC 20036
[202] 833-4100

Association of Information and Dissemination Centers
P.P. Box 8105
Athens, GA 30603
[404] 542-3106

Association of International Libraries
United Nations Library
Palais des Nations
CH-1211 Geneva 10
Switzerland

Association for Literary and Linguistic Computing
Literary and Linguistic Computing Centre
Sidgwick Site
Cambridge, CB3 9DA
England

Association of Public Data Users
P.O. Box 9287
Rosslyn Station
Arlington, VA 22209
[703] 525-1480

Association of Records Managers and Administrators
P.O. Box 281
Bradford, RI 02808
[401] 322-1338

Association of Research Libraries (ARL)
1527 New Hampshire Avenue, NW
Washington, DC 20036
[202] 232-2466

Association of Special Libraries and Information Bureaxu (ASLIB)
3 Belgrave Square
London, SW1X 8PL
England

Association for Systems Management
24587 Bagley Road
Cleveland, OH 44138
[216] 243-6900

Association of Time Sharing Users, Inc.
75 Manhattan Drive
Boulder, CO 80303
[303] 499-1722

Business Equipment Manufacturers Association
1828 L Street, NW
Washington, DC 20036
[202] 466-2288

Canadian Association for Information Science
Box 776, Station G
Calgary, Alberta T3A 2G6
Canada

Canadian Library Association
151 Sparks Street
Ottawa, Ontario K1P 5E3
Canada

Center for Research Libraries
5721 Cottage Grove Avenue
Chicago, IL 60637
[312]

Continuing Library Education Network Exchange (CLENE)
620 Michigan Avenue, NE
Washington, DC 20064
[202] 635-5825

Council for Community Services, Inc.
Social Data Exchange Association
229 Waterman Street
Providence, RI 02906
[401] 861-5550

Council for Computerized Networks
c/o Barbara F. Markuson
Indiana Cooperative Library Services Authority
1100 West 42nd Street
Indianapolis, IN 46208
[317] 923-7936

Data Processing Management Association (DPMA)
505 Busse Highway
Park Ridge, IL 60068
[312] 825-8124

Drug Information Association
Business Office:
1050 George Street (Apt. 5-L)
New Brunswick, NJ 08901
[201] 247-5630

European Association of Scientific Information Dissemination Centers
P.O. Box 1766
The Hague
The Netherlands

Geoscience Information Society
c/o American Geological Institute
5705 Leesburg Pike
Falls Church, VA 22041
[703] 379-2480

Graphic Communications Computer Association
1730 North Lynn Street
Arlington, VA 22209
[703] 841-8160

Health Sciences Communications Association
P.O. Box 79
Millbrae, CA 94036
[415] 666-1958

Information Industry Association (IIA)
316 Pennsylvania Avenue, SE
Suite 500
Washington, DC 20003
[202] 544-1969

Institute of Electrical and Electronics Engineers
Computer Group
345 East 47th Street
New York, NY 10017
[212] 644-7900

Institute of Information Scientists, The
657 High Road
Tottenham, London N17 8AA
England

Institute of Management Sciences, The (TIMS)
146 Westminster Street
Providence, RI 02903
[401] 274-2525

International Association of Agricultural Librarians and Documentalists
c/o D. E. Gray
Ministry of Agriculture, Fisheries and Food Library
Central Veterinary Laboratory
New Haw
Weybridge, Surrey KT15 3NB
England

International Association for Mathematics and Computers in Simulation
H 496 Avenue Moliere
B-1060 Brussels
Belgium

International Association for Social Science Information Service and Technology: U.S. Secretariat
Princeton University Computer Center
87 Prospect Avenue
Princeton, NJ 08544
[609] 452-6000

International Council of Scientific Unions–Abstracting Board
51 Boulevard Montmorency
F-75016 Paris
France

International Council for Technical Communication
Major H. R. Hockley, Public Relations Officer
Banstead Secretarial Services Ltd.
28 Green Curve
Banstead, Surrey
England

International Federation for Documentation (FID)
P.O. Box 30115
2500 GC
The Hague
The Netherlands

International Federation for Information Processing (IFIP)
3 Rue du Marche
CH-1204, Geneva
Switzerland

International Federation of Library Associations and Institutions
Netherlands Congress Building Tower
P.O. Box 82128
2508 EC
The Hague
The Netherlands

International Word Processing Association (IWP)
Maryland Road
Willow Grove, PA 19090
[215] 657-3220

Library Association, The
7 Ridgmount Street
London WC1E 7AE
England

Medical Library Association
919 North Michigan Avenue, Suite 3208
Chicago, IL 60611
[312] 266-2456

National Academy of Sciences–National Research Council–U.S.
National Committee for FID
Office of Information
2101 Constitution Avenue
Washington, DC 20418
[202] 393-8100

National Association for State Information Systems
Iron Works Pike
Lexington, KY 40511
[606] 252-2291

National Commission on Libraries and Information Science (NCLIS)
1717 K Street, NW
Suite 601
Washington, DC 20036
[202] 653-6252

National Federation of Abstracting and Indexing Services (NFAIS)
3401 Market Street
Philadelphia, PA 19104
[215] 349-8495

National Micrographics Association, The
8728 Colesville Road, Suite 1101
Silver Springs, MD 20910
[301] 587-8444

Online User Groups (Regional USA, and International)
See:
Online User Group Directory published by
Online, Inc.
11 Tannery Lane
Weston, CT 06883

Operations Research Society of America
428 East Preston Street
Baltimore, MD 21202
[301] 528-4146

Scientific and Technical Association for Research in Documentary Information
A.S.T.R.I.D. House
89, Koningin Astridlaan
B-9000
Ghent
Belgium

Society of American Archivists
The Library
P.O. Box 8198
University of Illinois, Chicago Circle
Chicago, IL 60680
[312] 996-8974

Society for Applied Learning Technology
50 Culpeper Street
Warrenton, VA 22186
[703] 347-0055

Society for General Systems Research
Lisner Hall, Room 601
2023 G Street, NW
Washington, DC 20052
[202] 676-7155

Society for Information Display
654 N. Sepulveda Boulevard
Los Angeles, CA 90049
[213] 472-3550

Society for Management Information Systems
One Illinois Center
111 East Wacker Drive
Chicago, IL 60601
[312] 644-6610

Society for Technical Communication
1010 Vermont Avenue, NW
Suite 421
Washington, DC 20005
[202] 737-0035

Special Libraries Association (SLA)
235 Park Avenue, South
New York, NY 10003
[212] 777-8136

U.S. Library of Congress–Federal Library Committee
10 First Street, SE
Washington, DC 20540
[202] 287-5000

United States National Committee for FID
2101 Constitution Avenue, NW
Washington, DC 20418
[202] 393-8100

Urban and Regional Information Systems Association (URISA)
c/o Municipal Finance Officers Association
180 N. Michigan Avenue
Chicago, IL 60601
[312] 977-9700

World Information Systems Exchange
800 North Fourth Street
Phoenix, AZ 85004

APPENDIX D

Colleges and Universities in the United States and Canada with Programs of Study in Information

The following are the principal colleges and universities in North America with programs of education and training in information science studies. Five sources, each providing different sets of data on the programs, were used in compiling the list, which spans the period 1971 to 1979. In cases where the name of the school, department, or program had been changed over the years, the most up-to-date version of the name is given. Each item is keyed to the source in which it was cited.

SOURCES

1 Wilkie, Lorna, *Directory of Educational Programs in Information Science; 1971-1972,* Washington, DC: American Society for Information Science, 1972. 105p.

2 Alvarez, Octavio, and others, *A Report on Library and Information Science Education in the United States, 1975.* College Park, Maryland: University of Maryland, College of Library and Information Services. 111p. (Student Contribution Series No. 7).

3 American Society for Information Science, "Graduate Programs in Information Science Leading to a Degree," in *Bulletin of the American Society for Information Science,* Washington, DC: ASIS, Vol. 3, No. 6 (August) 1977.

4 Taylor, Robert S., "Preliminary List of Schools and Departments with a Concern for Information Management." Unpublished list (courtesy of the author). March 1979.

5 Levine, Maria G., and Mary E. McCann, "Survey: Library and Information Science Degree Programs," *Information World*, Vol. 1, No. 8: September 1979. (Special four-page supplement)

Canadian institutions are indicated by an asterisk before the name.

INSTITUTION	SCHOOL/DEPARTMENT/PROGRAM	SOURCE[a]
American University	Center for Technology and Administration	1, 2, 3
Auburn University	Department of Industrial Engineering	1, 2
	Electrical Engineering Department	1
Bradley University	Computer Science Department	1, 2
Brigham Young University	School of Library and Information Sciences	2
California State University, Sacramento	School of Business Administration	1, 2
Carnegie-Mellon University	Graduate School of Industrial Administration	4
Case Western Reserve University	School of Library Science	1, 2, 3, 4, 5
Catholic University of America	Graduate Department of Library and Information Science	1, 5
City University of New York	Center for Advancement of Library–Information Science	1, 2
Clarion State College	School of Library Science	2
Columbia University	School of Library Science	1, 2, 5
Cornell University	Department of Computer Science	1, 2, 3
Dalhousie University	School of Library Service	1, 2
Drexel University	School of Library and Information Science	1, 2, 3, 4, 5
Florida State University	School of Library Science	2, 5
George Peabody College for Teachers	School of Library Science	1, 2, 5
Georgia Institute of Technology	School of Information and Computer Science	1, 2, 3, 4
Harvard University	Master of Information Science Program	1, 2, 4
Illinois Institute of Technology	Department of Computer Science	1, 2
Indiana University	Graduate Library School	1, 2, 3, 5
Kansas State University	Department of Computer Science	1, 2
Lehigh University	Division of Information Science	1, 2, 3
Long Island University (C. W. Post Center)	Palmer Graduate Library School	1, 2, 5
Louisiana State University	Graduate School of Library Science	2, 5
Mankato State College	Instructional Media and Technology	2
Massachusetts Institute of Technology	Electrical Engineering Department	1, 2
	Sloan School of Management	4
*McGill University	Graduate School of Library Science	1, 2
Michigan State University	Department of Communication	4
New York University	Graduate School of Business Administration	4
North Texas University	School of Library and Information Science	2
Northern Illinois University	Department of Library Science	1, 5
Ohio State University	College of Engineering	3
	Department of Computer and Information Science	1, 2, 3, 4
Pennsylvania State University	Department of Computer Science	1, 2
Pratt Institute	Graduate School of Library and Information Science	1, 2, 5
Queen's College, City University of New York	Department of Library Science	1, 2, 5
Rosary College	Graduate School of Library Science	1, 5
Rutgers University	Graduate School of Library and Information Studies	1, 2, 5
Simmons College	School of Library Science	1, 2, 5
Southern Connecticut State College	Division of Library and Instructional Technology	5
Stanford University	Graduate School of Business	4
	Institute for Communication Research	1, 2, 3, 4

[a] Explanation of codes used is given on page preceding the commencement of this list

*Institutions in Canada; all other institutions are in the United States of America

INSTITUTION	SCHOOL/DEPARTMENT/PROGRAM	SOURCE[a]
State University of New York at Albany	School of Library and Information Science	2, 3, 5
State University of New York at Buffalo	School of Information and Library Studies	1, 2, 5
State University of New York at Geneseo	College of Arts and Sciences: School of Library and Information Science	2, 5
St. John's University (New York)	Division of Library and Information Sciences	1, 2, 3, 5
Syracuse University	School of Information Studies	1, 2, 3, 4, 5
Temple University	Information Science Department	2
Texas Women's University	School of Library Science	2, 5
*Université de Montreal	Ecole de Bibliotheconomie	1
University of Alabama	Graduate School of Library Science	2, 5
*University of Alberta	Department of Computing Science	1
	School of Library Science	1
*University of British Columbia	School of Librarianship	1
University of California at Berkeley	Electrical Engineering and Computer Sciences Department	1
	Graduate School of Business Administration	4
	School of Library and Information Studies	1, 2, 3, 4, 5
University of California at Los Angeles	Computer Science Department	1, 2
	Graduate School of Library and Information Science	1, 2, 3, 4, 5
	Graduate School of Management	4
University of Chicago	Graduate Library School	1, 2, 3, 4, 5
University of Denver	Graduate School of Librarianship and Information Management	1, 2, 5
University of Houston	Computer Science Department	1, 2
University of Illinois	Graduate School of Library Science	1, 2, 3, 5
University of Iowa	School of Library Service	1, 5
University of Kentucky	College of Library Science	1, 2, 5
University of Maryland	College of Library and Information Services	1, 2, 3, 4, 5
	Department of Computer Science	1, 3
University of Michigan	Department of Computer and Communication Science	1, 2
	Department of Industrial Engineering	1, 2
	School of Library Science	1, 2, 3, 5
University of Minnesota	School of Business Administration	4
University of Missouri at Columbia	School of Library and Informational Science	1, 2, 5
University of Missouri at Rolla	Computer Science Department	1, 2
University of North Carolina, Chapel Hill	Department of Computer Science	1, 2
	School of Library Science	1, 2, 5
University of Oklahoma	Graduate Program in Information and Computing Science	1, 2
	School of Library Sciences	5
University of Oregon	School of Librarianship	1, 2
University of Pennsylvania	Moore School of Electrical Engineering	1, 2
	Wharton School of Business	4
University of Pittsburgh	Department of Computer Science	1, 2
	School of Library and Information Science, Dept. of Library Science and Interdisciplinary Department of Information Science	1, 2, 3, 4, 5
University of Rhode Island	Graduate Library School	2, 5

[a] Explanation of codes used is given on page preceding the commencement of this list

*Institutions in Canada; all other institutions are in the United States of America

INSTITUTION	SCHOOL/DEPARTMENT/PROGRAM	SOURCE[a]
University of South Carolina	College of Librarianship	2, 5
University of South Florida	Graduate Department of Library, Media, and Information Studies	5
University of Southern California	Annenberg School of Communications	4
	School of Library Science	1, 2, 3, 5
University of Southern Mississippi	Department of Library Science	1, 2
University of Tennessee, Knoxville	Graduate School of Library and Information Science	1, 2
University of Texas at Austin	Computer Science Department	1, 2
	Graduate School of Business	4
	Graduate School of Library Science	1, 2, 3, 4
University of Toledo	Department of Library and Information Services	1, 2
* University of Toronto	Faculty of Library Science	1, 2
University of Utah	Division of Instructional Systems and Learning Resources	2
University of Washington, Seattle	Computer Science Group	1, 2
	School of Communication	4
	School of Librarianship	1, 2, 5
* University of Western Ontario	School of Library and Information Science	1, 2, 3
University of Wisconsin, Madison	Department of Computer Science	1, 2
	Library School	1, 5
University of Wisconsin, Milwaukee	School of Library Science	1, 2, 5
Wayne State University	Division of Library Science	5
Washington University (St. Louis)	Department of Applied Mathematics and Computer Science	1, 2
Western Michigan University	School of Librarianship	1, 5
Yale University	Interdisciplinary Program in Information Science	1, 2

[a] Explanation of codes used is given on page preceding the commencement of this list

*Institutions in Canada; all other institutions are in the United States of America

NOTE

The above five sources give descriptive material on programs and courses offered, using a variety of criteria for inclusion (e.g., American Library Association accreditation, information science courses, etc.). In selecting institutions from the five sources, we have added our own set of criteria (e.g., institutions offering three or more courses in information science, etc.). The problem of acquiring current data is acknowledged, and we are conscious that we may have omitted from the above list colleges or universities which have augmented their information science courses in recent years. The list should, therefore, be treated only as a general guide and not as an exhaustive survey.

For those interested in an analytical (as distinct from a descriptive) statement of the current state of information science education, the article by Eugene Garfield entitled "Information Science Education–An Ivory Tower of Babel" in the February 1980 issue of *Current Contents* is recommended.

APPENDIX E

Sample Questionnaire and Cover Letter Used in the Occupational Survey of Information Professionals 1980

A sample questionnaire for each of the four sectors surveyed--Industry, State and Local Governments, Federal Government, and Colleges and Universities--is attached.

Page 1 of the questionnaire is different for each sector; page 2 has some minor differences in the "Definitions and Scope of Survey" and the "Instructions" sections; pages 3 and 4 are identical for all four sectors. The questionnaires were color coded by sector for ease in handling during the data organization phase of the survey.

Permission to use the questionnaires was given by the Office of Management and Budget (OMB) whose permit number appears in the top right-hand corner of page 1 on each questionnaire.

The sample cover letter attached was that used for respondents in the Industry sector; a similar letter with minor variations was sent to respondents in each of the other three sectors.

King Research, Inc.

6000 Executive Boulevard, Rockville, Maryland 20852 (301) 881-6766

(Date)

[SAMPLE of cover letter sent to industrial establishments; same letter with minor variations was sent to respondents in the other three sectors]

....
....
....
....
....

Dear

We need your assistance and support. There has been little or no attempt in the past to measure the level of manpower engaged in information activities, to characterize the kind of work to be performed, or to establish the extent of the impact on the universal working environment. The result is that much of the human effort involved in information handling activities is poorly identified and improperly classified, making it difficult to get an accurate estimate of the extent of information activities. Due to insufficient reporting, present resource expenditures may well be underestimated, giving an inadequate measure of the cost to the nation. Also, the lack of clear job classifications makes it difficult for industrial operations to make manpower projections, to plan future information systems, or to provide an integrated approach to education and training of information professionals.

In an attempt to respond to these needs, the University of Pittsburgh is conducting a national survey to estimate the number of professionals who are performing information functions. King Research Incorporated has been contracted to collect the data for this survey. This work is sponsored by the National Science Foundation, funded through Grant No. DSI-7727115.

Private industry, Federal, state and local government agencies, and academic institutions are being asked to supply data on the number and type of professional employees in their organizations who are primarily engaged in information functions. Your assistance will be invaluable in enabling us to estimate the number of individuals who are employed in such occupations. In turn, the availability of such data on a national scale should assist private industry in personnel planning and operations.

We have designed the questionnaire so as to minimize the amount of your time required to complete it. However, the data requested on information professionals will not always be available from existing records of your organization. To secure this information, it may be necessary to consult, on a selective basis, heads of operating units or personnel officers of your organization.

If we can provide further background or assistance, please call collect Candy Olsen [301] 881-6766, or Tom Moberg [412] 624-5207.

We greatly need and value your cooperation in this survey.

Yours sincerely,

DONALD W. KING
President

Encl.

Center for Quantitative Sciences

King Research Inc.
6000 Executive Boulevard
Rockville, MD 20852
Telephone: (301) 881-6766 (call collect)

Contact: Candy Olsen

Occupational Survey of Information Professionals

A survey conducted by King Research, Inc.,
for the University of Pittsburgh, as part of a research project
funded by the National Science Foundation, Grant No. DSI - 7727115.

INDUSTRY

The data collected on this form will be held in
confidence and will be used for statistical purposes only.

OMB No. 99 S 79006
Expires February, 1980

This questionnaire consists of two parts:

1 REPORTING UNIT CHARACTERISTICS

2 NUMBER OF PROFESSIONALS PERFORMING INFORMATION FUNCTIONS

YOUR PARTICIPATION, WHILE VOLUNTARY, WOULD BE GREATLY APPRECIATED. PLEASE MAIL THIS FORM, WHEN COMPLETED TO KING RESEARCH INC. IN THE ENCLOSED ENVELOPE.

Part 1 – Reporting Unit Characteristics

1. The scope of the reporting unit is as follows:

☐ The reporting unit for this survey includes all U.S. operations of the company/organization shown on the mailing label at the right. (Excludes incorporated subsidiaries).

☐ The reporting unit for this survey is the ESTABLISHMENT at the location on the mailing label at the right. Excludes any incorporated subsidiaries at this location. (Please correct if name and address has changed).

☐ The reporting unit for this survey is: ______________________

If the scope of the reporting unit as described above, or any other aspects of this questionnaire are not clear, please telephone Candy Olsen at King Research, Inc. (301) 881-6766. (Call collect)

2. If questions arise concerning your report, whom should we contact?

Name ______________________
Title ______________________
Street Address ______________________
City and State ______________ ZIP ________
Telephone: (____) ______________________

3. Give the status of reporting unit:

If the reporting unit described at the left no longer operates under your management, is out of business, or has undergone other major organizational changes in the past twelve months, please check the appropriate box below.

☐ This unit has been sold or merged. New name and address: ______________________

☐ This unit is out of business.

☐ Other (describe): ______________________

If you checked ANY of the boxes in Question 3 above, please stop here and return this partially completed questionnaire to King Research Inc. in the enclosed self-addressed stamped envelope. Otherwise, continue.

4. Please describe the *principal* activity (or activities) of this reporting unit, e.g. manufacturing (incl. products manufactured), business services (incl. kind of services), etc.

____

5. Is this reporting unit part of a larger organization or institution?

☐ Yes.
If yes, what is the closest location to this reporting unit at which the parent organization operates? (Enter location and name of operating unit.) ______________________

☐ No. This is our only location.

☐ Special situation (explain): ______________________

6. How many employees did this reporting unit have as of the last payroll?

Total number of employees ____________
Reference payroll period ____________

7. If there are any information activities performed within separately organized sub-units, check the presence of such sub-units.
(Check all that apply.)

(NOTE: Use your own interpretation of "information activities" to answer this question. We will define them for our own purposes in part 2.)

Abstracting or Indexing Unit	☐
Computer Operations Unit	☐
Computer Systems Analysis/Programming Unit	☐
Data Bank	☐
Information Analysis Center/Unit/Group	☐
Library	☐
Management Information System	☐
Research or Analysis Unit	☐
Technical Information Unit	☐
Technical Reports Preparation Unit	☐

Other (describe) 1 ______________________
2 ______________________
3 ______________________
4 ______________________

IN COMPLETING THE REMAINDER OF THIS FORM, PLEASE CONSIDER NOT ONLY THESE ACTIVITIES OR SUB-UNITS, BUT ALSO ANY OTHERS WHICH MAY INVOLVE EMPLOYEES ENGAGED IN INFORMATION ACTIVITIES.

Part 2 – Number of Professionals Performing Information Functions

Definitions and Scope of Survey

Part 2 relates to full-time professional-level employees who perform as primary activities the nine information functions A through I, described on the facing page. Function J allows you to note additional information activities.

Information sources include written materials, bibliographic data, numeric data, and other materials such as audiovisual materials, cartographic materials, etc.

Professional-level work generally requires relevant college education at *bachelors degree level* or its equivalent in work experience.

A primary activity is a function, or set of related functions, on which *employees spend at least 50 percent of their worktime,* or which the employers consider to be their primary responsibility even though it occupies less than 50 percent of worktime.

The information functions in which we are interested involve work performed on data or information *on behalf of others.*

Sample occupational titles are provided as illustrations, *but we are interested in persons performing the designated information functions regardless of their occupational titles.*

Instructions

1. In the first column, enter the SUB-UNIT within your reporting unit, and in the next column, the OCCUPATIONAL TITLES of persons performing information activities. (NOTE: You may have several occupational titles for each organizational sub-unit. Also, you may have the same occupational titles in different units.)
2. Enter in the function columns the number of full-time professional-level employees in the reporting unit (as of last payroll) who perform these information functions as primary activities. Do this separately for each occupational title. Count persons only once in the area of their primary activity, i.e., the function on which they spend at least 50 percent of their time, OR which the employers consider to be their primary responsibility even though it occupies less than 50 percent of their time. To make these allocations, consider the whole range of assignments over 12 months.
3. Please supply a brief description of the J Functions on the lines provided (facing page). Enter in columns J1, 2, or 3 the number of persons performing these functions.

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
		(See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
											1	2	3

Additional space is available on the back page

Information Function Descriptions

A. MANAGING INFORMATION OPERATIONS, PROGRAMS, SERVICES OR DATABASES: Includes planning, directing, or administering information operations, programs, services or databases; establishing budgets, funding, and financial control; planning and controlling resource-sharing or networking activities; establishing and implementing security standards for information systems; forming and implementing corporate information policy; integrating information operations, programs, services, or databases with mission of parent organization; surveying users to establish information needs; promoting information products/services. Sample occupational titles: *Audio-Visual Administrator, Chief Programmer, Comptroller, Database Manager, Director of Information Center, Library Administrator, Library Director, Manager of Publishing Unit, Management Analyst, Media Manager, Science Editor, and Vice-President for Information.*

B. PREPARING DATA OR INFORMATION FOR USE BY OTHERS: Includes technical writing (but not public relations promotions), editing, or other scientific publishing activities involving journals, technical reports, manuals, instructions, etc.; translating business, scientific or technical works from one lanugage to another; compiling bibliographies, reference materials or referral materials, etc.; preparing abstracts, indexes or catalogs; preparing lists or directories of people, buildings, events, etc; establishing computer numeric or textual data input requirements; transforming data into form required by a computer system, operational system, or library; preparing other information materials, such as audio-visual, cartographic, etc. Sample occupational titles: *Abstractor, Archivist, Bibliographer, Cataloger, Classifier, Librarian (Research), Librarian (Special Collections), Medical Records Specialist, Science Editor, Survey Data Editor, Technical Editor, Technical Writer, and Translator.*

C. ANALYSIS OF DATA AND INFORMATION ON BEHALF OF OTHERS: Includes researching and analysis (but not end-use) of data or information from a library, computer file, or other database; analysis of data or information that goes beyond (but which may include) such activities as abstracting, or simple summarization of previously written materials, computer system output, or library materials. Sample occupational titles: *Analysis Specialist, Information Counselor, Operations Analyst, Research Assistant, Subject Matter Specialist (e.g. economic analyst, financial analyst, management analyst) and User Consultant.*

D. SEARCHING FOR DATA AND INFORMATION ON BEHALF OF OTHERS: Includes diagnosing user needs for information; identifying data sources and developing search strategies; accessing databases either manually (library shelves) or electronically (automated systems); evaluating yield of data searches (but not performing analysis of data); referring users to other sources of data or information. Sample occupational titles: *Information Counselor, Reference Librarian, Reference Specialist, Referral Specialist, Searcher, and Technical Information Specialist.*

E. INFORMATION SYSTEMS ANALYSIS: Includes analyzing existing work processes; determining feasibility of system automation; determining output product and form; selecting data or information for inclusion in system; recommending design alternatives; evaluating information systems, products or services. Sample occupational titles: *Computer Systems Analyst, Chief Programmer, Data Processing Systems Analyst, Operations Researcher, Senior Programmer, Software Specialist, Systems Analyst, and Word Processing Systems Analyst.*

F. INFORMATION SYSTEMS DESIGN: Includes designing new systems or modifying existing systems; establishing procedures for carrying out work processes; implementing the systems design; evaluating system output to ensure that it meets user requirements; documenting the procedures involved in using the system, for system personnel and for users. Sample occupational titles: *Computer Systems Planner, Database Designer, Methods Analyst, Operations Designer, Senior Programmer, Systems Designer, Systems Project Planner, and Word Processing Systems Planner.*

G. OPERATIONAL INFORMATION FUNCTIONS (excluding management): Includes supervising the running of a library or automated information system; controlling and facilitating access procedures; developing and implementing procedures for data input to systems (including library acquisitions); developing and implementing software packages for computer systems; designing applications programs to fit user needs. Sample occupational titles: *Applications Programmer, Archivist, Audio-Visual Specialist, Computer Specialist, Computer System Consultant, Database Administrator, Librarian (Acquisitions), Librarian (Medical Records), Librarian (Special Collections).*

H. EDUCATING OR TRAINING INFORMATION WORKERS: Includes teaching courses on information subjects to undergraduate or graduate students; training information professionals or workers on the job, in workshops or seminars; planning information education programs; developing information curricula; research on information education (but other information research is included in Function I). Sample occupational titles: *Faculty Member (College or University), Instructor, Lecturer, and Training Officer.*

I. INFORMATION RESEARCH & DEVELOPMENT: Includes studying the foundations, laws, theories, and postulates related to information and information systems, operations, programs, services, or databases; performing research on the creation of new forms of information systems, operations, products, processes, services, etc.; developing models of information systems or operations; designing, collecting, and analyzing secondary and primary data in information research; research on the use of information systems, products, or services; research on information user behavior and characteristics. Sample occupational titles: *Communications Researcher, Computer Scientist, Information Scientist, Library Scientist, Persons with Methods Expertise (e.g. Operations Research, Psychology, Statistics, Systems Analysis, etc.) and Persons with Subject Expertise (e.g. Behavioral Science, Engineering, Mathematics, Philosophy, Semiotics, Etc.)*

J. OTHER INFORMATION FUNCTIONS, to be specified by respondents:

1. ______________________________

____

2. ______________________________

____

3. ______________________________

____

continued from table on page 2

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
		(See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
											1	2	3

5

King Research Inc.
6000 Executive Boulevard
Rockville, MD 20852
Telephone: (301)-881-6766 (call collect)

Contact: Candy Olsen

Occupational Survey of Information Professionals

A Survey conducted by King Research, Inc.,
for the University of Pittsburgh, as part of a research project
funded by the National Science Foundation, Grant No. DSI - 7727115.

OMB No. 99 S 79006
Expires February, 1980

STATE AND LOCAL GOVERNMENTS

The data collected on this form will be held in confidence and will be used for statistical purposes only.

This questionnaire consists of two parts:

1 REPORTING UNIT CHARACTERISTICS

2 NUMBER OF PROFESSIONALS PERFORMING INFORMATION FUNCTIONS

YOUR PARTICIPATION, WHILE VOLUNTARY, WOULD BE GREATLY APPRECIATED. PLEASE MAIL THIS FORM, WHEN COMPLETED, TO KING RESEARCH INC. IN THE ENCLOSED ENVELOPE.

Part 1.– Reporting Unit Characteristics

1. The scope of reporting unit is as follows:

A ☐ The reporting unit for this survey is the complete agency, organizational unit or jurisdiction on the mailing label to the right.

B ☐ The reporting unit for this survey is the component(s) of the agency or organizational unit shown on the mailing label to the right which directly provides services included in the ______________ governmental function category*, or provides support and maintenance functions for others in that service.

C ☐ The reporting unit for this survey is ______________

____

*The governmental functions are detailed in the Attachment. They correspond to the definitions used for reporting employment by function to the Governments Division of the U.S. Bureau of Census.

If the scope of the reporting unit as described above, or any other aspects of this questionnaire are not clear, please telephone Candy Olsen at King Research, Inc. (301) 881-6766. (Call collect.)

2. If questions arise concerning your report, whom should we contact?

Name ______________

Title ______________

Street Address ______________

City and State ______________ ZIP ______________

Telephone: (____) ______________

3. Check all governmental functions performed, or supported, by personnel in your agency or organizational unit (as shown on the mailing label) whether or not specified at the left as included in the reporting unit for this survey.

☐ Airports
☐ Corrections
☐ Education
☐ Employment Security Administration
☐ Financial Administration
☐ Fire Protection
☐ General Control
☐ Health
☐ Hospitals
☐ Housing & Urban Renewal
☐ Libraries
☐ Liquor Stores
☐ Natural Resources
☐ Parks and Recreation
☐ Police Protection
☐ Public Welfare
☐ Sanitation Other than Sewerage
☐ Sewerage
☐ Streets and Highways
☐ Utilities
☐ Water Transport and Terminals
☐ Other. Specify below:

____

____

____

4. How many employees did this reporting unit have for the payroll period which includes October 15, 1979?

	Total	FT
a) in the agency or organizational unit shown on the mailing label	___	___
b) engaged in providing the services, or in providing support and maintenance for governmental functions, if specified in B or C at the left.	___	___

5. If there are any information activities performed within separately organized sub-units, check the presence of such sub-units. (Check all that apply.)

(NOTE:- Use your own interpretation of "information activities" to answer this question. We will define them for our own purposes in Part 2.)

Abstracting or Indexing Unit ☐
Computer Operations Unit ☐
Computer Systems Analysis/Programming Unit ☐
Data Bank ☐
Extension Office ☐
Information Analysis Center/Unit/Group ☐
Library ☐
Management Information System ☐
Research or Analysis Unit ☐
Technical Information Unit ☐
Technical Reports Preparation Unit ☐
Other (describe) 1 ______________
2 ______________
3 ______________

IN COMPLETING THE REMAINDER OF THIS FORM, PLEASE CONSIDER NOT ONLY THESE ACTIVITIES OR SUB-UNITS, BUT ALSO ANY OTHERS WHICH MAY INVOLVE EMPLOYEES ENGAGED IN INFORMATION ACTIVITIES.

6

Part 2 – Number of Professionals Performing Information Functions

Definitions and Scope of Survey

Part 2 relates to full-time professional-level employees who perform as primary activities the nine information functions A through I, described on the facing page. Function J allows you to note additional information activities.

Information sources include written materials, bibliographic data, numeric data, and other materials such as audiovisual materials, cartographic materials, etc.

Professional-level work generally requires relevant college education at *bachelors degree level* or its equivalent in work experience.

A primary activity is a function, or set of related functions, on which *employees spend at least 50 percent of their worktime,* or which the employers consider to be their primary responsibility even though it occupies less than 50 percent of worktime.

The information functions in which we are interested involve work performed on data or information *on behalf of others.*

Sample occupational titles are provided with the functional definitions which may be illustrative of titles used in private industry for persons performing the designated functions. These titles, and others, may be used in some components of your agency but *we are interested in personnel performing the designated functions regardless of their occupational titles.*

Instructions

1. In the first column, enter the SUB-UNIT within your reporting unit, and in the next column, the OCCUPATIONAL TITLES of persons performing information activities. (NOTE: You may have several occupational titles for each organizational sub-unit. Also, you may have the same occupational titles in different units.)
2. Enter in the function columns the number of full-time professional-level employees in the reporting unit (as of last payroll) who perform these information functions as primary activities. Do this separately for each occupational title. Count persons only once in the area of their primary activity, i.e., the function on which they spend at least 50 percent of their time, OR which the employers consider to be their primary responsibility even though it occupies less than 50 percent of their time. To make these allocations, consider the whole range of assignments over 12 months.
3. Please supply a brief description of the J Functions on the lines provided (facing page). Enter in columns J1, 2, or 3 the number of persons performing these functions.

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
		(See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
											1	2	3

Additional space is available on the back page

Information Function Descriptions

A. MANAGING INFORMATION OPERATIONS, PROGRAMS, SERVICES OR DATABASES: Includes planning, directing, or administering information operations, programs, services or databases; establishing budgets, funding, and financial control; planning and controlling resource-sharing or networking activities; establishing and implementing security standards for information systems; forming and implementing corporate information policy; integrating information operations, programs, services, or databases with mission of parent organization; surveying users to establish information needs; promoting information products/services. Sample occupational titles: *Audio-Visual Administrator, Chief Programmer, Comptroller, Database Manager, Director of Information Center, Library Administrator, Library Director, Manager of Publishing Unit, Management Analyst, Media Manager, Science Editor, and Vice-President for Information.*

B. PREPARING DATA OR INFORMATION FOR USE BY OTHERS: Includes technical writing (but not public relations promotions), editing, or other scientific publishing activities involving journals, technical reports, manuals, instructions, etc.; translating business, scientific or technical works from one lanugage to another; compiling bibliographies, reference materials or referral materials, etc.; preparing abstracts, indexes or catalogs; preparing lists or directories of people, buildings, events, etc; establishing computer numeric or textual data input requirements; transforming data into form required by a computer system, operational system, or library; preparing other information materials, such as audio-visual, cartographic, etc. Sample occupational titles: *Abstractor, Archivist, Bibliographer, Cataloger, Classifier, Librarian (Research), Librarian (Special Collections), Medical Records Specialist, Science Editor, Survey Data Editor, Technical Editor, Technical Writer, and Translator.*

C. ANALYSIS OF DATA AND INFORMATION ON BEHALF OF OTHERS: Includes researching and analysis (but not end-use) of data or information from a library, computer file, or other database; analysis of data or information that goes beyond (but which may include) such activities as abstracting, or simple summarization of previously written materials, computer system output, or library materials. Sample occupational titles: *Analysis Specialist, Information Counselor, Operations Analyst, Research Assistant, Subject Matter Specialist (e.g. economic analyst, financial analyst, management analyst) and User Consultant.*

D. SEARCHING FOR DATA AND INFORMATION ON BEHALF OF OTHERS: Includes diagnosing user needs for information; identifying data sources and developing search strategies; accessing databases either manually (library shelves) or electronically (automated systems); evaluating yield of data searches (but not performing analysis of data); referring users to other sources of data or information. Sample occupational titles: *Information Counselor, Reference Librarian, Reference Specialist, Referral Specialist, Searcher, and Technical Information Specialist.*

E. INFORMATION SYSTEMS ANALYSIS: Includes analyzing existing work processes; determining feasibility of system automation; determining output product and form; selecting data or information for inclusion in system; recommending design alternatives; evaluating information systems, products or services. Sample occupational titles: *Computer Systems Analyst, Chief Programmer, Data Processing Systems Analyst, Operations Researcher, Senior Programmer, Software Specialist, Systems Analyst, and Word Processing Systems Analyst.*

F. INFORMATION SYSTEMS DESIGN: Includes designing new systems or modifying existing systems; establishing procedures for carrying out work processes; implementing the systems design; evaluating system output to ensure that it meets user requirements; documenting the procedures involved in using the system, for system personnel and for users. Sample occupational titles: *Computer Systems Planner, Database Designer, Methods Analyst, Operations Designer, Senior Programmer, Systems Designer, Systems Project Planner, and Word Processing Systems Planner.*

G. OPERATIONAL INFORMATION FUNCTIONS (excluding management): Includes supervising the running of a library or automated information system; controlling and facilitating access procedures; developing and implementing procedures for data input to systems (including library acquisitions); developing and implementing software packages for computer systems; designing applications programs to fit user needs. Sample occupational titles: *Applications Programmer, Archivist, Audio-Visual Specialist, Computer Specialist, Computer System Consultant, Database Administrator, Librarian (Acquisitions), Librarian (Medical Records), Librarian (Special Collections).*

H. EDUCATING OR TRAINING INFORMATION WORKERS: Includes teaching courses on information subjects to undergraduate or graduate students; training information professionals or workers on the job, in workshops or seminars; planning information education programs; developing information curricula; research on information education (but other information research is included in Function I). Sample occupational titles: *Faculty Member (College or University), Instructor, Lecturer, and Training Officer.*

I. INFORMATION RESEARCH & DEVELOPMENT: Includes studying the foundations, laws, theories, and postulates related to information and information systems, operations, programs, services, or databases; performing research on the creation of new forms of information systems, operations, products, processes, services, etc.; developing models of information systems or operations; designing, collecting, and analyzing secondary and primary data in information research; research on the use of information systems, products, or services; research on information user behavior and characteristics. Sample occupational titles: *Communications Researcher, Computer Scientist, Information Scientist, Library Scientist, Persons with Methods Expertise (e.g. Operations Research, Psychology, Statistics, Systems Analysis, etc.) and Persons with Subject Expertise (e.g. Behavioral Science, Engineering, Mathematics, Philosophy, Semiotics, Etc.)*

J. OTHER INFORMATION FUNCTIONS, to be specified by respondents:

1.

2.

3.

continued from table on page 2

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
		(See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
											1	2	3

King Research Inc.
6000 Executive Boulevard
Rockville, MD 20852
Telephone: (301) 881-6766 (call collect)

Contact: Candy Olsen

Occupational Survey of Information Professionals

A survey conducted by King Research, Inc.,
for the University of Pittsburgh, as part of a research project
funded by the National Science Foundation, Grant No. DSI - 7727115.

FEDERAL AGENCIES

The data collected on this form will be held in
confidence and will be used for statistical purposes only.

OMB No. 99 S 79006
Expires February, 1980

This questionnaire consists of two parts:

1 REPORTING UNIT CHARACTERISTICS

2 NUMBER OF PROFESSIONALS PERFORMING INFORMATION FUNCTIONS

YOUR PARTICIPATION, WHILE VOLUNTARY, WOULD BE GREATLY APPRECIATED. PLEASE MAIL THIS FORM, WHEN COMPLETED, TO KING RESEARCH INC. IN THE ENCLOSED ENVELOPE.

Part 1 – Reporting Unit Characteristics

1. The scope of the reporting unit is as follows:

☐ The reporting unit for this survey is the component of your agency designated by the Submitting Office Name (SON) and code at the right as used for personnel reports to the Office of Personnel Management (OPM).

☐ The reporting unit for this survey is: ____________________

If the scope of the reporting unit as described above, or any other aspects of this questionnaire are not clear, please telephone Candy Olsen at King Research, Inc. (301) 881-6766. (Call collect.)

2. If questions arise concerning your report, whom should we contact?

Name ____________________
Title ____________________
Street Address ____________________
City and State ____________________ ZIP ________
Telephone (____) ____________________

3. Give the status of the reporting unit:

If the agency component designated by SUBMITTING OFFICE NAME for personnel reporting to OPM has been changed as compared with our mailing label please check the current situation and supply requested information.

☐ The designated Submitting Office is now included as part of a larger submitting office which is as follows:

New Submitting Office Name ____________________
Address ____________________
Contact ____________________
Telephone (____) ____________________

☐ The designated Submitting Office has been reorganized into several different submitting offices as follows:

Submitting Office Name ____________________
Address ____________________
Contact ____________________
Telephone (____) ____________________

Submitting Office Name ____________________
Address ____________________
Contact ____________________
Telephone (____) ____________________

4. Please check below the description of activities that applies to your Submitting Office:

☐ Executive, legislative, or judicial operations, excluding military, and excluding government-owned business and service establishments

☐ Military

☐ Manufacturing activities
Specify: ____________________

☐ Postal Service

☐ Transportation and Public Utilities, except Postal

☐ Hospital

☐ Other services ____________________

Additional comments, if any: ____________________

5. How many employees did this reporting unit have on September 30, 1979? Report civilian personnel only.

Total, all employees ________

Total, full-time employees ________

6. If there are any information activities performed within separately organized sub-units, check the presence of such sub-units. (Check all that apply.)

(NOTE:- Use your own interpretation of "information activities" to answer this question. We will define them for our own purposes in Part 2.

Abstracting and Indexing Unit ☐
Command and Control Unit ☐
Computer Operations Unit ☐
Computer Systems Analysis/Programming Unit ☐
Data Bank ☐
Extension Office ☐
Information Analysis Center/Unit/Group ☐
Library ☐
Management Information System ☐
Research or Analysis Unit ☐
Technical Information Unit ☐
Technical Reports Preparation Unit ☐
Other (describe) 1 ____________________
2 ____________________

IN COMPLETING THE REMAINDER OF THIS FORM, PLEASE CONSIDER NOT ONLY THESE ACTIVITIES OR SUB-UNITS, BUT ALSO ANY OTHERS WHICH MAY INVOLVE EMPLOYEES ENGAGED IN INFORMATION ACTIVITIES.

10

Part 2 – Number of Professionals Performing Information Functions

Definitions and Scope of Survey

Part 2 relates to full-time professional-level employees who perform as primary activities the nine information functions A through I, described on the facing page. Function J allows you to note additional information activities.

Information sources include written materials, bibliographic data, numeric data, and other materials such as audiovisual materials, cartographic materials, etc.

Professional-level work generally requires relevant college education at *bachelors degree level* or its equivalent in work experience.

A primary activity is a function, or set of related functions, on which *employees spend at least 50 percent of their worktime,* or which the employers consider to be their primary responsibility even though it occupies less than 50 percent of worktime.

The information functions in which we are interested involve work performed on data or information *on behalf of others.*

Sample occupational titles used in private industry are provided as illustrations, *but we are interested in personnel performing the designated information functions regardless of the Federal Occupational Series in which they are classified.*

Report civilian personnel only.

Instructions

1. In the first column, enter the SUB-UNIT within your reporting unit, and in the next column, the OCCUPATIONAL TITLES of persons performing information activities. (NOTE: You may have several occupational titles for each organizational sub-unit. Also, you may have the same occupational titles in different units.)
2. Enter in the function columns the number of full-time professional-level employees in the reporting unit (as of last payroll) who perform these information functions as primary activities. Do this separately for each occupational title. Count persons only once in the area of their primary activity, i.e., the function on which they spend at least 50 percent of their time, OR which the employers consider to be their primary responsibility even though it occupies less than 50 percent of their time. To make these allocations, consider the whole range of assignments over 12 months.
3. Please supply a brief description of the J Functions on the lines provided (facing page). Enter in columns J1, 2, or 3 the number of persons performing these functions.

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
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Additional space is available on the back page

Information Function Descriptions

A. MANAGING INFORMATION OPERATIONS, PROGRAMS, SERVICES OR DATABASES: Includes planning, directing, or administering information operations, programs, services or databases; establishing budgets, funding, and financial control; planning and controlling resource-sharing or networking activities; establishing and implementing security standards for information systems; forming and implementing corporate information policy; integrating information operations, programs, services, or databases with mission of parent organization; surveying users to establish information needs; promoting information products/services. Sample occupational titles: *Audio-Visual Administrator, Chief Programmer, Comptroller, Database Manager, Director of Information Center, Library Administrator, Library Director, Manager of Publishing Unit, Management Analyst, Media Manager, Science Editor, and Vice-President for Information.*

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E. INFORMATION SYSTEMS ANALYSIS: Includes analyzing existing work processes; determining feasibility of system automation; determining output product and form; selecting data or information for inclusion in system; recommending design alternatives; evaluating information systems, products or services. Sample occupational titles: *Computer Systems Analyst, Chief Programmer, Data Processing Systems Analyst, Operations Researcher, Senior Programmer, Software Specialist, Systems Analyst, and Word Processing Systems Analyst.*

F. INFORMATION SYSTEMS DESIGN: Includes designing new systems or modifying existing systems; establishing procedures for carrying out work processes; implementing the systems design; evaluating system output to ensure that it meets user requirements; documenting the procedures involved in using the system, for system personnel and for users. Sample occupational titles: *Computer Systems Planner, Database Designer, Methods Analyst, Operations Designer, Senior Programmer, Systems Designer, Systems Project Planner, and Word Processing Systems Planner.*

G. OPERATIONAL INFORMATION FUNCTIONS (excluding management): Includes supervising the running of a library or automated information system; controlling and facilitating access procedures; developing and implementing procedures for data input to systems (including library acquisitions); developing and implementing software packages for computer systems; designing applications programs to fit user needs. Sample occupational titles: *Applications Programmer, Archivist, Audio-Visual Specialist, Computer Specialist, Computer System Consultant, Database Administrator, Librarian (Acquisitions), Librarian (Medical Records), Librarian (Special Collections).*

H. EDUCATING OR TRAINING INFORMATION WORKERS: Includes teaching courses on information subjects to undergraduate or graduate students; training information professionals or workers on the job, in workshops or seminars; planning information education programs; developing information curricula; research on information education (but other information research is included in Function I). Sample occupational titles: *Faculty Member (College or University), Instructor, Lecturer, and Training Officer.*

I. INFORMATION RESEARCH & DEVELOPMENT: Includes studying the foundations, laws, theories, and postulates related to information and information systems, operations, programs, services, or databases; performing research on the creation of new forms of information systems, operations, products, processes, services, etc.; developing models of information systems or operations; designing, collecting, and analyzing secondary and primary data in information research; research on the use of information systems, products, or services; research on information user behavior and characteristics. Sample occupational titles: *Communications Researcher, Computer Scientist, Information Scientist, Library Scientist, Persons with Methods Expertise (e.g. Operations Research, Psychology, Statistics, Systems Analysis, etc.) and Persons with Subject Expertise (e.g. Behavioral Science, Engineering, Mathematics, Philosophy, Semiotics, Etc.)*

J. OTHER INFORMATION FUNCTIONS, to be specified by respondents:

1. ____

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2. ____

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3. ____

____

continued from table on page 2

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
		(See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
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OMB No. 99 S 79006
Expires February, 1980

COLLEGES AND UNIVERSITIES

The data collected on this form will be held in confidence and will be used for statistical purposes only.

This questionnaire consists of two parts:

1 REPORTING UNIT CHARACTERISTICS

2 NUMBER OF PROFESSIONALS PERFORMING INFORMATION FUNCTIONS

YOUR PARTICIPATION, WHILE VOLUNTARY, WOULD BE GREATLY APPRECIATED. PLEASE MAIL THIS FORM, WHEN COMPLETED, TO KING RESEARCH INC. IN THE ENCLOSED ENVELOPE.

Part 1 – Reporting Unit Characteristics

1. The scope of the reporting unit is as follows:

☐ The scope of this institution corresponds to the listing in the *Education Directory, Colleges and Universities, 1977-78,* with the associated Federal Interagency Committee on Education (FICE) code on the mailing label.

☐ The reporting unit for this survey is: ______________________________
____

If the scope of the reporting unit as described above, or any other aspects of this questionnaire are not clear, please telephone Candy Olsen at King Research, Inc. (301) 881-6766. (Call collect)

2. If questions arise concerning your report, whom should we contact?

Name ______________________________
Title ______________________________
Street Address ______________________________
City and State ______________ ZIP ______________
Telephone: (____) ______________________________

3. Give the status of reporting unit:

If the reporting unit described earlier has had any major changes as compared with the description of the institution in the *Education Directory, Colleges and Universities, 1977-78,* please supply the data below:

☐ Additional schools or campuses have been added and are considered part of this institution defined by the specified FICE code. These schools/campuses are as follows:
____
____
____

☐ Schools or campuses formerly part of this institution as defined by the specified FICE code are now considered separate institutions with their own FICE codes. These schools/campuses are:

NAME	FICE CODE

☐ Additional comments on scope of institution defined as reporting unit for this survey:
____
____
____

4. How many employees did this reporting unit have on September 30, 1979?

Total, full- and part-time employees ____________
Total, full-time employees ____________

5. If there are any information activities performed within separately organized sub-units, check the presence of such sub-units. (Check all that apply.)

(NOTE: Use your own interpretation of "information activities" to answer this question. We will define them for our own purposes in Part 2.)

Abstracting or Indexing Unit ☐
Computer Operations Unit ☐
Computer Systems Analysis/Programming Unit ☐
Data Bank ☐
Information Analysis Center/Unit/Group ☐
Library ☐
Management Information System ☐
Research or Analysis Unit ☐
School (or Department) of Information Science and/or Library Science ☐
Technical Information Unit ☐
Technical Reports Preparation Unit ☐
Other (describe) 1 ______________________________
2 ______________________________
3 ______________________________
4 ______________________________

IN COMPLETING THE REMAINDER OF THIS FORM, PLEASE CONSIDER NOT ONLY THESE ACTIVITIES OR SUB-UNITS, BUT ALSO ANY OTHERS WHICH MAY INVOLVE EMPLOYEES ENGAGED IN INFORMATION ACTIVITIES.

Part 2 – Number of Professionals Performing Information Functions

Definitions and Scope of Survey

Part 2 relates to full-time professional-level employees who perform as primary activities the nine information functions A through I, described on the facing page. Function J allows you to note additional information activities.

Information sources include written materials, bibliographic data, numeric data, and other materials such as audiovisual materials, cartographic materials, etc.

Professional-level work generally requires relevant college education at *bachelors degree level* or its equivalent in work experience.

A primary activity is a function, or set of related functions, on which *employees spend at least 50 percent of their worktime*, or which the employers consider to be their primary responsibility even though it occupies less than 50 percent of worktime.

The information functions in which we are interested involve work performed on data or information *on behalf of others*.

Sample occupational titles used in private industry are provided as illustrations, *but we are interested in persons performing the designated information functions regardless of their occupational titles*. We expect that some will be reported by faculty rank, or designated as research associates, postdoctoral research associates, non-faculty research professionals, specialist/support personnel, etc. Graduate research and teaching assistants are out of the scope of this survey.

Instructions

1. In the first column, enter the SUB-UNIT within your reporting unit, and in the next column, the OCCUPATIONAL TITLES of persons performing information activities. (NOTE: You may have several occupational titles for each organizational sub-unit. Also, you may have the same occupational titles in different units.)
2. Enter in the function columns the number of full-time professional-level employees in the reporting unit (as of last payroll) who perform these information functions as primary activities. Do this separately for each occupational title. Count persons only once in the area of their primary activity, i.e., the function on which they spend at least 50 percent of their time, OR which the employers consider to be their primary responsibility even though it occupies less than 50 percent of their time. To make these allocations, consider the whole range of assignments over 12 months.
3. Please supply a brief description of the J Functions on the lines provided (facing page). Enter in columns J1, 2, or 3 the number of persons performing these functions.

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION											
		(See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
											1	2	3

Additional space is available on the back page

Information Function Descriptions

A. MANAGING INFORMATION OPERATIONS, PROGRAMS, SERVICES OR DATABASES: Includes planning, directing, or administering information operations, programs, services or databases; establishing budgets, funding, and financial control; planning and controlling resource-sharing or networking activities; establishing and implementing security standards for information systems; forming and implementing corporate information policy; integrating information operations, programs, services, or databases with mission of parent organization; surveying users to establish information needs; promoting information products/services. Sample occupational titles: *Audio-Visual Administrator, Chief Programmer, Comptroller, Database Manager, Director of Information Center, Library Administrator, Library Director, Manager of Publishing Unit, Management Analyst, Media Manager, Science Editor, and Vice-President for Information.*

B. PREPARING DATA OR INFORMATION FOR USE BY OTHERS: Includes technical writing (but not public relations promotions), editing, or other scientific publishing activities involving journals, technical reports, manuals, instructions, etc.; translating business, scientific or technical works from one lanugage to another; compiling bibliographies, reference materials or referral materials, etc.; preparing abstracts, indexes or catalogs; preparing lists or directories of people, buildings, events, etc; establishing computer numeric or textual data input requirements; transforming data into form required by a computer system, operational system, or library; preparing other information materials, such as audio-visual, cartographic, etc. Sample occupational titles: *Abstractor, Archivist, Bibliographer, Cataloger, Classifier, Librarian (Research), Librarian (Special Collections), Medical Records Specialist, Science Editor, Survey Data Editor, Technical Editor, Technical Writer, and Translator.*

C. ANALYSIS OF DATA AND INFORMATION ON BEHALF OF OTHERS: Includes researching and analysis (but not end-use) of data or information from a library, computer file, or other database; analysis of data or information that goes beyond (but which may include) such activities as abstracting, or simple summarization of previously written materials, computer system output, or library materials. Sample occupational titles: *Analysis Specialist, Information Counselor, Operations Analyst, Research Assistant, Subject Matter Specialist (e.g. economic analyst, financial analyst, management analyst) and User Consultant.*

D. SEARCHING FOR DATA AND INFORMATION ON BEHALF OF OTHERS: Includes diagnosing user needs for information; identifying data sources and developing search strategies; accessing databases either manually (library shelves) or electronically (automated systems); evaluating yield of data searches (but not performing analysis of data); referring users to other sources of data or information. Sample occupational titles: *Information Counselor, Reference Librarian, Reference Specialist, Referral Specialist, Searcher, and Technical Information Specialist.*

E. INFORMATION SYSTEMS ANALYSIS: Includes analyzing existing work processes; determining feasibility of system automation; determining output product and form; selecting data or information for inclusion in system; recommending design alternatives; evaluating information systems, products or services. Sample occupational titles: *Computer Systems Analyst, Chief Programmer, Data Processing Systems Analyst, Operations Researcher, Senior Programmer, Software Specialist, Systems Analyst, and Word Processing Systems Analyst.*

F. INFORMATION SYSTEMS DESIGN: Includes designing new systems or modifying existing systems; establishing procedures for carrying out work processes; implementing the systems design; evaluating system output to ensure that it meets user requirements; documenting the procedures involved in using the system, for system personnel and for users. Sample occupational titles: *Computer Systems Planner, Database Designer, Methods Analyst, Operations Designer, Senior Programmer, Systems Designer, Systems Project Planner, and Word Processing Systems Planner.*

G. OPERATIONAL INFORMATION FUNCTIONS (excluding management): Includes supervising the running of a library or automated information system; controlling and facilitating access procedures; developing and implementing procedures for data input to systems (including library acquisitions); developing and implementing software packages for computer systems; designing applications programs to fit user needs. Sample occupational titles: *Applications Programmer, Archivist, Audio-Visual Specialist, Computer Specialist, Computer System Consultant, Database Administrator, Librarian (Acquisitions), Librarian (Medical Records), Librarian (Special Collections).*

H. EDUCATING OR TRAINING INFORMATION WORKERS: Includes teaching courses on information subjects to undergraduate or graduate students; training information professionals or workers on the job, in workshops or seminars; planning information education programs; developing information curricula; research on information education (but other information research is included in Function I). Sample occupational titles: *Faculty Member (College or University), Instructor, Lecturer, and Training Officer.*

I. INFORMATION RESEARCH & DEVELOPMENT: Includes studying the foundations, laws, theories, and postulates related to information and information systems, operations, programs, services, or databases; performing research on the creation of new forms of information systems, operations, products, processes, services, etc.; developing models of information systems or operations; designing, collecting, and analyzing secondary and primary data in information research; research on the use of information systems, products, or services; research on information user behavior and characteristics. Sample occupational titles: *Communications Researcher, Computer Scientist, Information Scientist, Library Scientist, Persons with Methods Expertise (e.g. Operations Research, Psychology, Statistics, Systems Analysis, etc.) and Persons with Subject Expertise (e.g. Behavioral Science, Engineering, Mathematics, Philosophy, Semiotics, Etc.)*

J. OTHER INFORMATION FUNCTIONS, to be specified by respondents:

1. ______________________________
   ____
2. ______________________________
   ____
3. ______________________________
   ____

continued from table on page 2

SUB-UNIT	OCCUPATIONAL TITLE	NUMBER OF PERSONNEL BY PRIMARY INFORMATION FUNCTION (See opposite page for explanation of each letter code)											
		A Managing information operations, programs, services, or databases	B Data / info. Preparation on behalf of others	C Data / info. Analysis on behalf of others	D Searching for data / info. on behalf of others	E Information Systems Analysis	F Information Systems Design	G Other operational Information Functions excl. management	H Educating or Training Information Workers	I Information Research & Development	J Other Information functions		
											1	2	3